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ORIGINAL COMMUNICATIONS.

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THE EXPLORATORY OPENING OF THE SPHENOID SINUS.*

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By "exploratory" I mean an opening that can be made so extemporaneously, with so little discomfort to the patient, so little derangement of his ordinary pursuits, that it may be employed for merely exploratory or diagnostic purposes.

It has not required a great amount of experience to teach us that a large number of empyemas of the maxillary and frontal sinuses will yield within a reasonable time after the establishment of proper drainage, to cleansing and antiseptic irrigation and to judicious local medication. These cases are not limited to those of recent development only, but include many that have entered the chronic class, and I think it not unlikely that many of us are in the habit of giving such patients a fair chance to display their recuperative powers under conservative treatment before we insist upon radical operation. What is true of these sinuses is, I believe, true also of an even larger proportion of infectious inflammations within the spenoid sinus, and it is that we may give this sinus the same opportunity for natural repair that I advocate the making of an artificial opening in its anterior wall at a point as close as possible to *the angle of junction of its floor with its internal wall.*

*Read before the American Laryngological, Rhinological, and Otological Society, Atlantic City, June 20, 1914.

As regards its safety and the facility with which it is made, this opening is on a par with the puncture of the nasal wall of the antrum beneath the inferior turbinate, or with the simple enlargement of the ostium frontale by means of the rasp or other instrument. As an operation it is no more formidable than these others, and it is usually even more easy of performance. This opening can be utilized for both exploratory and therapeutic purposes and it has the advantage of not involving in its making either the destruction or crippling of any of the functionally valuable intra-nasal structures. Since the site at which it is made is most remote from those intra-cranial structures the proximity or, indeed, contiguity of which to the roof and external wall of the sinus make the vicinity of these latter dangerous ground, this is unquestionably the safest point at which the sinus can be entered.

Until the spring of last year I had been exploring and treating for several years a number of sphenoid sinuses by this route without thinking that I was doing anything that had not already been done probably many times by many operators. Both anatomically and surgically this point of entrance to the sinus seemed to me so obviously logical that I did not suspect that I was alone in employing this method or even one of but a small number.

At the annual meeting of the Pennsylvania State Medical Society at Scranton, in 1913, however, I read a brief paper the principal object of which was to promote the conservation of the natural resources of the nose or, to put it differently, to deprecate the frequently unnecessary operative sacrifice of the turbinated bodies. It was particularly in connection with the preservation of the middle turbinates in operations upon the sphenoid sinus that I urged a more frequent resort to this opening of the sinus at the lower and inner corner of its anterior wall instead of, what I believed to be, the customary procedure of removing the turbinate as the first step of these operations. From the discussion that followed the reading of my paper I was able to draw one of only two conclusions—either that my audience had failed to comprehend where and how I made the opening into the sinus, or that I was entirely mistaken as to the comparative surgical safety of that portion of the sinus cavity that I have indicated. I propose as briefly as possible to review the matter with you and to ask the benefit of your opinion.

In the first place, with regard to the surgical anatomy of the sinus, we know that its floor lies, with remarkably few excep-

tions, not more than two or three millimeters above the crescentic line that marks at once the base of the sphenoid body and the upper margin of the posterior choana. The examination of a large number of skulls by numerous investigators has demonstrated that the septum between the right and left sinuses, however much it may deviate to one or the other side posteriorly, almost invariably occupies anteriorly the middle line. Again, although the two sinuses may vary very greatly in their relative size, although one may be almost rudimentary and the other large enough to almost envelop it, yet the attempted envelop-

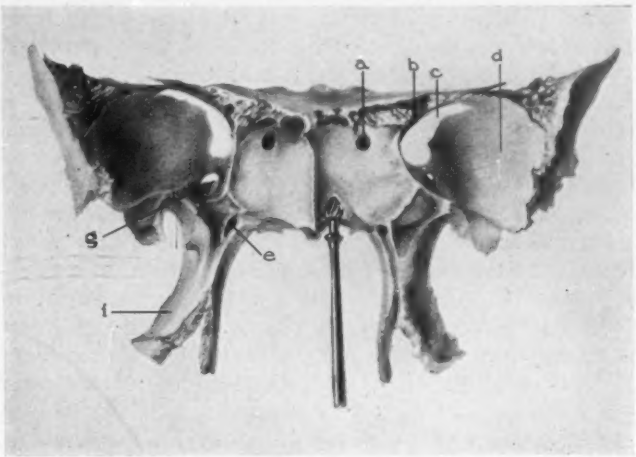

Figure 1. Anterior view of body of sphenoid bone. Tip of drill just above floor of sinus and close to its mesial wall

ment will occur behind and above and even external to it, but never in front of it. A most valuable contribution to our knowledge of the relative size, position and cubical capacity of the sphenoid sinuses will be found in two papers by a distinguished fellow of this society, Dr. H. W. Loeb, one of them published in the *Annals of Otology, Rhinology and Laryngology,* June, 1909, and the other in the same journal in March, 1912.

Although we take it for granted that no one will undertake the surgery of this sinus without a mastery of its individual and regional anatomy, yet in these days of perfected radiography there can be no necessity or excuse for the taking of chances in the matter of encountering possible anomalies. If, therefore, one

should be in doubt even as to the existence of the sinus, if its ostium cannot be located or the clinical signs present are not conclusive in their testimony, a series of radiographs taken at different angles will provide us with all the knowledge necessary to make the opening of the sphenoid as nearly as possible absolutely free from uncertainty and risk.

A very few words will suffice for the operation. The inner or nasal portion of the anterior surface of the sphenoid body is exposed as widely as possible by shrinking the turbinates with one of the adrenal preparations. The field of operation is anesthetized with cocain and then rendered ischemic by the adrenal solution. When this has been done the course of the sphenopalatine artery is usually so distinctly visible that it can be readily avoided. The application of a dilute tincture of iodin will be sufficient for purposes of sterilization. The instrument with which I perforate the sinus wall is a straight drill. It is tipped with a conical burr 6 mm. in length and measuring 2½ mm. from its point to its greatest diameter. I have already indicated the spot to which the drill is applied—*2 or 3 mm. above the line which divides the anterior from the inferior surface of the sphenoid body and close to the attachment of the ethmoid plate in the middle line.* The opening that it makes is 2 mm. in diameter, a size quite sufficient to permit the escape of any fluid within the sinus, the introduction of an appropriate irrigating cannula or, should it seem advisable, the distal jaw of a biting forceps with which the opening may be enlarged.

I have never known a patient to complain that the operation was painful. The blood shed is scarcely more than a trace. There is no shock and if the patient is not already in bed there is no occasion to order him there. If the exploration of the sinus proves to be pathologically negative, the breach will close within twenty-four hours. A mild form of consternation that seemed to attack some of my Scranton audience last year was due, I think, to a misunderstanding as to the manner in which this drill is used. I know that one of them at least must have got the impression that I attached it to a dental engine or an electro-motor, else he would scarcely have warned me that "ripping and tearing" my way into the sphenoid sinus was a highly dangerous procedure. I want no such impression to find a lodging in your minds. The drill is intended to be manipulated by the hand only, the thumb and finger being sufficient to rotate it. Once engaged in the bone it will make its way practically with-

out pressure, and a hand endowed with only the most ordinary sense of touch will know the moment that the burr has reached the point of its greatest girth. I use this drill in preference to a curette or a trocar and cannula for these reasons—that it will penetrate the wall, as I have just said, practically without pressure; that the bone is perforated cleanly and smoothly instead

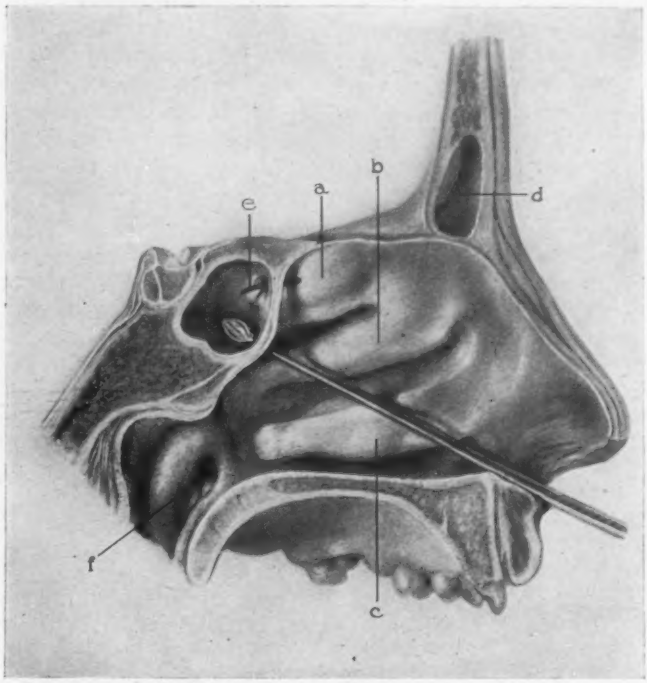

Figure. 2. Lateral view of external wall of nasal fossa and sphenoid sinus with relative situations of the anatomical and surgical openings of the latter. (I am indebted to Dr. Warren B. Davis for permission to adapt this illustration to my purpose. It is one of those prepared for his recent admirable work on the "Anatomy and development of the nasal accessory sinuses.")

of being scraped and perhaps more or less splintered; that the opening is always of the same size, and that no larger than necessary; and, finally, that no more tissue is injured than that represented by the size of the opening.

In advocating this method of investigating the sphenoid sinus, I do not for a moment assume that I am proposing a new

operation. I am doing no more than suggesting that we *begin* our operations upon its anterior wall at its point of greatest safety instead of *ending* them there. If improved drainage and a brief course of irrigations are all that are needed to relieve symptoms and to remove the pathological condition present, we have in this opening one that is perfectly situated for drainage and one through which the cavity can be readily and thoroughly cleansed. My own experience has provided me with very few cases in which cleansing of this sinus could be satisfactorily effected by way of its natural opening. The situation and size of the ostium sphenoidale make it one of the several instances in which Nature has seemed not to have forseen and provided for certain pathological contingencies. Moreover, I say again, entering the sinus in this locality removes any necessity for even a partial ablation of the middle turbinate.

It will be pertinent to make some reference to certain conditions in which I have found this innocent and easily made opening of great utility and convenience. There are times when in spite of careful and repeated examinations we cannot be positive whether a stream of pus coming from the recessus sphenoethmoidale has its source in the posterior ethmoidal cells or in the sphenoid, or in both. In a few moments by means of this exploratory opening we can not only exclude the sphenoid should it be innocent, but if it be found to contain pus and this be evacuated and the sinus cleansed, then if the flow of pus from above continues we may be assured that the posterior ethmoidal cells are also the seat of a suppurative process.

The possible implication of the sphenoid sinus in the etiology of certain cases of neuralgia of the fifth nerve can be quickly decided by the making of this opening. Greenfield Sluder has already shown the dependence of many such neuralgias upon the irritation arising from infectious processes within the sphenoid, and closely allied to these neuralgias are many severe and persistent headaches, the understanding and the management of which would be greatly helped by a similar investigation of this sinus.

In addition to these painful affections there is a class of nasopharyngeal catarrhs, catarrhs of distinctly muco-purulent and irritative type, in which the futility of ordinary methods of treatment should suggest the exploration of the sphenoid. Manifestly, the cases to which I particularly refer are those in which the nose and the other accessory sinuses can be excluded as causative factors.

In closing, I hope I have made it clear that my object in exploiting this method of investigating the sphenoid sinus is, in the first place, to dislodge the idea that still seems existent in many minds that the ostium sphenoidale should always be the starting point for any operation upon the sinus; to lessen, if successful in this, the frequency with which the middle turbinate is unnecessarily removed, or, in other words, to substitute for a somewhat formidable and tissue-destroying operation one that is technically simple and unattended by any loss of functionally useful tissue; to lessen, also, the hesitation, the timidity even, with which some thoroughly qualified men contemplate the surgical invasion of this sinus. I hope no one will think that I underestimate the necessity for the utmost caution and skill. I emphatically do not, but I think that this sinus is often avoided and permitted to continue as a focus of infection because of an exaggerated conception of the danger that attends its exploration. I have not yet found any anatomic basis for regarding it as a sanctuary which even its guardian, the rhinologist, should enter with a trembling hand.

262 South Fifteenth Street.

Death During Tonsillectomy from Reflex Inhibition. HOMER DUPUY, *N. Orleans Med. and Surg. Jour.*, August, 1914.

From the article and discussion following it in the Orleans Parish Medical Society, it appears that the ether anesthesia was commenced with ethyl chlorid. Considerable difficulty was met in enucleating the tonsils and the hemorrhages and difficulty of operation retarded the procedure. During the second hour of the operation, the respiration stopped completely four times and was relieved by artificial respiration. Respiration stopped the fifth time fifteen minutes after the anesthetic had been discontinued. Although the pulse was fairly good, all attempts at resuscitation, including tracheotomy, artificial respiration, traction on the tongue, and oxygen administered through the trachea, were without avail.

SCHEPPEGRELL.

COLLAPSE OF THE ALAE NASI, ITS ETIOLOGY AND TREATMENT.*

Dr. Warren C. Batroff, Philadelphia.

This very troublesome condition of the vestibule of that organ which is so frequently the site of our surgical activities is often overlooked entirely or neglected. The otherwise perfect results which should follow a skillful intra-nasal operation may be impaired by lack of attention to this little detail. Being particularly impressed with the results obtained in the plastic surgery of the nose and nasal orifices by Halle and Joseph of Berlin, the author determined to make special investigations in the Laryngological Department of the Medico-Chirurgical Hospital and considered that a brief resume of this work with special reference to alae nasi would be timely.

The pathological collapse of the alae nasi occurs during forcible inspiration; normally these structures slightly dilate with deep breathing. During the respiratory collapse there is a partial vacuum formed in the vestibule of the nose. Coupled with the influence exerted by the external atmospheric pressure on the alae these structures are almost or completely pressed against the septum.

In opposition to this force are three factors, (1) the normal resiliency of the wings of the nose; (2) the presence of the alar cartilage which forms the concave vault of alae and which normally possesses considerable firmness and yet elasticity; (3) the three muscles, the levator labii superioris alaeque nasi, the dilator naris anterior and the dilator naris posterior. These forces are frequently sufficient to permit undisturbed breathing during an ordinary weak inspiration. Should, however, pathological alterations of one or several of the above factors be present, a forced inspiration produces a suction with collapse.

Patients are occasionally encountered who have acquired the habit of overcoming their difficulty by lifting the alae with the finger, when environment will permit. It is to be remembered that with partial closure of the nasal wings the normal free inspiration is lost and mouth-breathing thereby occurs. This will result in a continuous, although weak, negative pressure in the nose producing chronic hyperemia with secondary hypertrophic

*Read before the Philadelphia Laryngological Society, January 5, 1915.

changes. The amount of subjective suffering will vary considerably under similar pathological conditions. Many, particularly the neurotics, complain bitterly while others scarcely notice the difference. This is hardly strange as we know that patients often are not aware of gross abnormalities in their nasal breathing until their attention is directed to it by symptoms referable to the ear, throat, larynx, or bronchi, as they have been accustomed to the habit of partial mouth-breathing from childhood.

Moreover, collapse of the alae is particularly found as a secondary affection in individuals who have suffered from nasal ob-

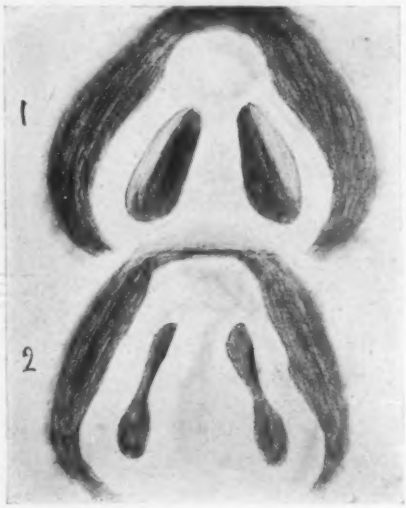

Figure. 1. Approximately normal nares.
Figure 2. Bilateral alar collapse with decided thickening of the septum membranaceum. Submucous resection of the septum performed with no relief until the above was corrected.

struction for years, the open mouths with the resultant drag on the sides of the nose coupled with the atrophy of the levator alae nasi group of muscles being the chief factors in producing the conditions. These cases will not always recover complete control after the removal of the obstructive lesion. Careful observation proves that anatomically all the parts forming the anterior aspect of the nasal passages as the cartilaginous septum, the septum membranaceum, the floor of the nose and the anterior inferior nasal spine, as well as the alae themselves, are instru-

mental in the production of this affection. Depression or flattening of one side may occur as a sequel of the hare-lip operation in childhood. In some cases an anomalous position and development of the triangular cartilage is the sole etiological factor.

As causes referable to the wing of the nose itself we must consider atrophy of the levator muscle group, relaxations of the subcutaneous tissues and a decidedly sharp vertical curvature of the alar cartilage. The first two have been mentioned by numerous authors, but attention was first called to the latter by Halle, of Berlin. It is distinguished externally by a deep sinking of the

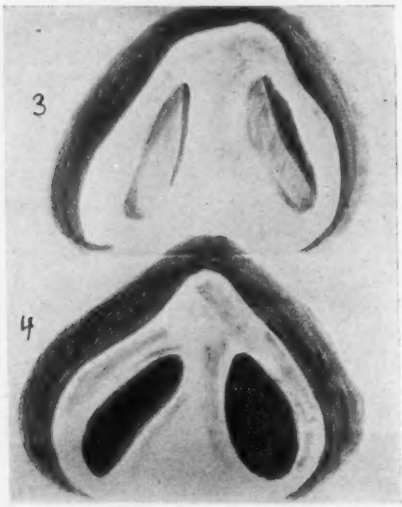

Figure 3. Right-side alar collapse due to sharp incurving of the cartilage, on the left subluxation of the septal cartilage.
Figure 4. Projection of the anterior inferior nasal spine producing excessive breadth of the septum membranaceum, particularly on the right side.

sulcus alaris, while examination internally reveals the upper edge of the cartilage projecting into the lumen of the nose, frequently in close apposition to or touching the mucosa of the septum.

These pronounced cases may be accompanied by congestion with a watery or mucous discharge. It is, therefore, of greatest importance to make the examination without the nasal speculum, being careful to spread the nasal orifice as little as possible, or otherwise the existing condition will be overlooked. With

this particular type ordinary, quiet breathing may be sufficient to produce total collapse or the "Ansaugen" of the Germans. Alar collapse may be produced in individuals with narrow nose and sharply curved deflection of the triangular cartilage anteriorly, or a decided subluxation of the cartilaginous septum.

Less attention, however, is given to the anomalies of the septum membranaceum. Normally this will be a compact fold of skin and fibrous tissue, conical in shape, lying directly beneath and in the same plane as the cartilaginous septum with the

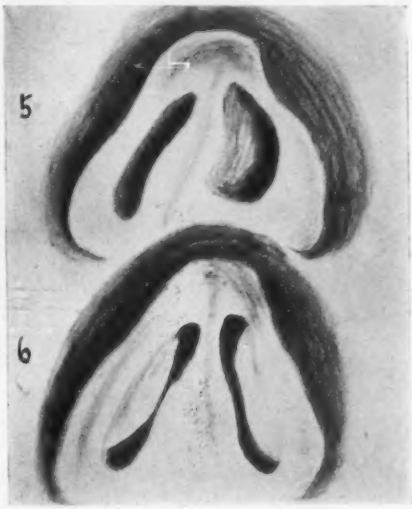

Figure 5. Alar collapse of right side with oblique position of septum membranaceum and a decided deflection of the septal cartilage on the left.
Figure 6. Pronounced thickening of the septum membranaceum with bilateral collapse of the alae.

apex of the cone anteriorly blending with the cartilage at the tip of the nose. This structure is subject to many and varied alterations of form, frequently being very broad throughout its entire length; thus very seriously narrowing the lumen of the nasal orifices.

As to the cause of this thickening, in some instaces it seems to be due to inherent developmental defects dating from birth, coupled with irritation from repeated furuncles, prolonged eczemas, which produce a true hyperplasia of the subcutaneous and submucous tissues. At times the anterior inferior nasal spine

projects rather sharply forward, and being broad on its anterior aspect spreads the tissues. Again the crus mediale, or short hook, of the alar cartilage which normally turns in and blends with the septum membranaceum may turn forward in the saggital plane, this with the augmented subcutaneous tissue may so contract the nasal orifice that nasal respiration is practically impossible.

Treatment: The treatment of this affection has generally been some form of splint or dilator, of which there are a large number

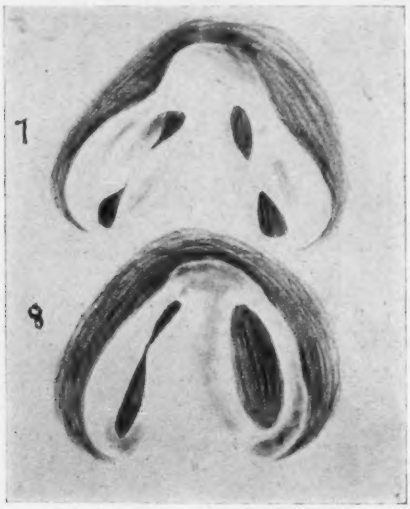

Figure 7. Exaggerated curvature of both alar cartilages into the septum membranaceum, with split septal cartilage and enormously thickened membranous septum.

Figure 8. Dislocation of the quadrangular cartilage lying in almost complete apposition with the lateral nasal wall, resulting in almost complete stenosis of the right side.

designed by different men in the various countries. They vary from the rather crude small rings cut from soft rubber tubing first used by Guy through the multiplicity of metal forms to the anatomically perfect molded hard rubber type designed by Schmidhuisen. These are absolutely invisible externally, are made in rights and lefts, and conform perfectly with the shape of the parts. All others that I have observed provoke more or less irritation, are frequently difficult of insertion by the patient and objectionable to some if visible externally. None of them

remove the condition, but only render more or less active orthopedic assistance, whereby the alae are unable to vibrate normally and regulate the intake of air in consequence of being held in rigid position.

In order to overcome this defect, Heerman advised the use of small cotton balls, covered with vaseline, tucked into the fossa navicularis of the vestibule, thus permitting proper exercise of the muscles controlling the alae. All these methods afford only imperfect relief, but must be utilized when the patient declines

Figure 9. Bilateral incurving of the alar cartilage with dislocation of the quadrangular cartilage.

Figure 10. An extreme example of sharply curved alar cartilage with enormous thickening of cartilaginous and membranous septum.

operation. Lack advises the patient to practice dilating the nostril against resistance, as standing before a mirror and lightly compressing the alae with the thumb and finger practice deep breathing for five minutes, twice daily. This is of use, however, only in recent cases.

Operative treatment: I shall mention briefly two methods designed to be of use irrespective of any particular cause for the collapse. First that devised by Walsham of elevating a strip of mucous membrane from the anterior part of the septum. The preparation and anesthesia are similar to that for submucous re-

section. The strip of membrane is left attached above, rolled into a mass at the upper angle of the nostril and stitched in that position. It has the disadvantage that the roll is frequently of insufficient bulk to distend the nostril and accomplish its purpose. The procedure originated by Lambert Lack consists of turning up a piece of the septal cartilage with its mucous membrane approximating an eighth of an inch in width and a half-inch in length. The upper surface of the flap and the later nasal wall against which it is to lie is gently curetted to encourage adhesion. It is then held in place by a single suture. This, of course, leaves a perforation which is not always considered good practice.

Before attempting any operation it is necessary to exercise the greatest care in the inspection of the nasal orifice in order to determine which part is responsible for the collapse. Weakness of the levator alae group of muscles can only be treated when the entrance of the nose is proved to be free, and then through exercise and massage may be restored to functional activity.

Should the alar cartilage be so sharply bent that the upper edge lies against the septum, the following may be employed: Sterilize the vestibule, and under novocain and adrenalin infiltration make an incision through the mucosa parallel to and slightly below the upper edge of the alar cartilage. Elevate the mucosa and periosteum approximately 3/16 of an inch, using a rather sharp elevator, working from above downward. Cut away a narrow strip of the cartilage sufficient that the lumen of the nostril will be restored. Two fine silk sutures should be inserted to hold the cut edges of the mucosa; then dress with aristol collodion. Should it be necessary to remove an unusually large strip of cartilage it is well to excise a small strip of mucous membrane; otherwise it might subsequently form a small cushion which would constitute an obstruction.

In the same manner it is possible to remove the lower edge of the alar cartilage when it occupies a position almost in apposition with the septum. It is extremely difficult to make the necessary elevation here; hence make the primary incision a short distance above the free edge of the cartilage where the mucosa is less firmly attached. The elevation is made from below upward with a Freer sharp elevator.

If the alar cartilage is thin and flabby and unable to resist the pressure of the current of air a method to increase its rigidity

is advised by Menzel. He makes an injection of paraffin between the skin and cartilage, molding the same into a thin plate. His technic is to pack the vestibule tightly with gauze, then introduce the needle into the naso-labial fold directed forward and upward, make the injection of a very small quantity of paraffin and press it inward against the packing mold into the desired shape. Skillern makes the injection from within the vestibule, the wax being thus between the mucous membrane and the cartilage, shaping it by pressure with the thumb inside and the forefinger externally. While this method has been used successfully in skilled hands it is open to the objection that if more than just sufficient paraffin be injected it will seriously impair the cosmetic effect.

Eckstein describes a novel method for removing sunken scars in the wing of the nose with resulting obstruction. He makes a small incision in the lower part of the sulcus alaris and draws a fine silver wire forward to the tip of the nose parallel with the edge of the cartilage. Next he carries it backward and upward, passing beneath the depression to the sulcus, then downward to the original point of entrance where they are united and fastened by a few turns and buried in the incision. The needle entering anteriorly and above in the small puncture made by it at its point of emergence, there is practically no scar. The original incision is then closed with a stitch. This forms a silver triangle invisible and quite effective cosmetically.

Halle modifies this by making an incision on the inner aspect of the alar cartilage, elevates the mucous membrane to form a pocket and inserts an oval-shaped ring of silver with a suitable curve, this being shaped to meet the demands of the particular case. Both operations are more satisfactorily performed under general anesthesia. Should deviation or subluxation of the septal cartilage be the etiologic factor it must be corrected by the usual submucous resection. More rarely as the cause, exostosis of the nasal floor or thickening of the anterior inferior nasal spine may be encountered. They may be removed by an incision at the muco-cutaneous junction along the lower bony edge of the nostril. Elevate the mucous membrane and periosteum and the projecting part is cut away with chisel or bone cutting forceps. Close the wound with sutures and healing is usually rapid.

It is eminently more difficult to remove a cone-shaped septum membranaceum. For this make a slightly curved incision at

the junction of the skin and mucous membrane parallel with the edge of the membranous septum, carrying it well forward to the tip of the nose. Retract the skin downward, elevate the mucous membrane and the thickened parts as the subcutaneous and submucous tissues are carefully cut away, preferably using a sharp knife. The skin and mucous membrane are then united with fine silk or horse-hair sutures. Should the opposite side be similarly affected it will be necessary to treat it likewise.

We shall then be confronted with the excessive width of the skin that is left. It is recommended by the author of this method to introduce a mattress suture as follows: The needle, threaded with heavy silk, is passed through the skin-segment close to the lip, then brought forward over a piece of gauze to the tip, passed through here. Another piece of gauze is placed on the opposite side and the suture firmly tied. The edges of the now smaller septum membranaceum are thus firmly pressed together. The gauze pads prevent the suture from cutting through the tissues. The stitches are removed in three to four days. The results with this method are excellent.

If this brief exposition of a frequently overlooked but not uncommon condition should stimulate further development and study of the subject the purpose of this paper shall have been served.

2456 North Seventeenth Street.

Early Symptomatology of Cancer of the Esophagus. HENRY H. JANEWAY, *Am. Jour. of Med. Sci.*, April, 1914, page 583.

The author dwells on the importance of the early recognition of cancer of the esophagus. He gives a table of twenty-one cases in which the symptoms in the early stages were of the most varied character and so vague as to be misleading. In the esophagoscope we have an easy and most reliable diagnostic measure which should be employed more frequently than is customary in the elucidation of symptoms referable to the esophagus. PACKARD.

PLASTIC OPERATION FOR DISLOCATED COLUMNAR CARTILAGE OF THE NOSE.

DR. EDMUND L. WARREN, St. Paul, Minn.

It is my purpose in this paper to describe an operation for the relief of deformity of the nostril due to the hypertrophy or malposition of the columnar cartilage of the nose. The condition is one which receives only the most meager mention in the text-books, either from the anatomical or the operative standpoint. This not infrequent deformity is usually overlooked as a cause of impaired nasal respiration, our attention often being directed to it by an individual seeking cosmetic relief.

Anatomically speaking, the columnar cartilage, which forms the framework of the columella is the median half of the lower lateral cartilage of the nose. This lower lateral cartilage forms approximately three-fourths of the margin or rim of the nostril. The anatomical position of the lower lateral cartilage will be seen in Figure 1. The mesial half, or the columnar cartilage, is embedded in the columella and forms part of the mobile septum of the nose. It lies flat against its fellow of the opposite side with its sharp edges approximating, posteriorly, the triangular cartilage of the septum, and anteriorly, the skin of the columella. It averages one-fourth inch in width and three-fourths of an inch in length.

Figure 2 shows the usual appearance of this deformity of the nose. Varying degrees of obstruction are met with, in some instances being so marked as to practically obstruct the nostril on the side of the deformity.

Operation: The entire region of the deformity having been injected subcutaneously with either 2 per cent cocain or novo-cain solution, a vertical incision is made through the skin just in front of the muco-cutaneous junction. This should extend from the upper to the lower limits of the deformity. This leaves any resulting scar well within the vestibule of the nose. Dissection is now carried out by means of a dull, narrow-bladed scalpel down to the dislocated, or posterior, edge of the columnar cartilage. This edge is then grasped with a small, curved hemostat forceps which serves both to lift the cartilage from its fascial bed and to obviate the use of retractors in so small a space. The perichondrium is separated from the cartilage, below to its lower end and above to the upper limits of the deformity where the cartilage is cut across and the piece removed *en masse*.

When the edges of the wound are approximated it will be seen that there is a redundancy of tissue which necessitates the removal of a strip of skin from that edge of the wound nearer the operator.

Three interrupted sutures are necessary to hold the edges of the wound together and thus overcome the tension. The dislocation of the columnar cartilage into one nostril invariably causes an absolute dislocation of the columella to the opposite side. This adds to the

Figure 1 shows deformity in right nostril due to dislocated columnar cartilage.

deformity to such an extent that the individual becomes aware of the crookedness of his nose. On tying the sutures it will be noticed that the columella is drawn to its anatomical position in the median

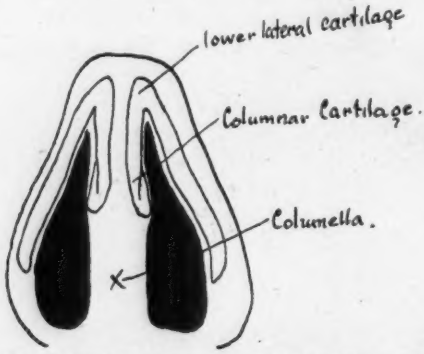

Figure 2 shows anatomical arrangement of cartilage in nostrils.

line. No packing is necessary. A pledget of cotton is placed in the vestibule to keep the wound surface clean and to prevent the oozing of blood and serum.

The results of this operation are, both a marked functional gain due to the more patent nostril and a decidedly better nose from a cosmetic standpoint.

710 Lowry Building.

POSTERIOR NASAL OPERATION BY MEANS OF THE NASO-PHARYNGYSCOPE.

Dr. C. Armin Gundelach, St. Louis.

On November 29, 1913, at a joint meeting of the Chicago Laryngological and Otological Society and the Oto-Laryngological Section of the Saint Louis Medical Society, I suggested the use of the naso-pharyngoscope as a means to further our knowledge of intra-sphenoidal as well as of intra-antral pathological conditions. Since then I have made and recorded many observations which now form the basis of this text.

The idea of looking into the sinuses takes on interest and importance as we come to the interpretation of conditions which heretofore have been beyond our field of vision. In this respect the use of the naso-pharyngoscope for intra-sinuous exploration means to the rhinologist what the introduction of the ophthalmoscope meant for the ophthalmologist.

In passing, it may be well to review briefly certain features of the anatomy in the posterior district of the nose. While clinical consideration of the frontal and anterior ethmoidal cells is of importance, nevertheless, the farther back the pathological process exists, the graver becomes its significance; for it is in the posterior district that ethmoidal and sphenoidal cells come into intimate contact with important nerve trunks, and where general anatomical relations are of greater moment. The sphenoid, for example, is in intimate contact with the cavernous sinus, through which pass the important III, IV and VI nerve-trunks, and in whose lateral walls are found the I and II divisions of the V. Further, the sphenoid with the carotid artery and its surrounding carotid plexus forms a prominence on the outer wall of the sinus; on the roof rests the pituitary body, and through its floor runs the Vidian nerve.

The external sphenoidal wall is often in juxta-position with the optic nerve, unless the body of the sphenoid contains a posterior ethmoidal cell, when the latter always forms the median wall of the optic canal and perhaps even the inferior wall, so as to comprise one-half of the optic canal. As is well known, a posterior ethmoidal cell is far more frequently in contact with the optic

canal than a sphenoidal cell, no matter what the size, position, or shape of the sphenoidal cell proper.

Just anterior to the sphenoid, at times situated below its floor, and posterior to the middle turbinate, is the spheno-palatine foramen, through which emerge the nerves from the nasal ganglion —a most important structure viewed in the light of the sensory and sympathetic nerve-supply of the nose and eye. Inflammatory processes running their course in the region about the foramen are necessarily of considerable seriousness. With such important relations, the great importance of the region from a clinical point of view is at once obvious.

The determination of the line and angle of attachment of the middle turbinate with the nasal wall is important in the injection of the nasal ganglion according to the technic of Sluder. Holmes injects the ganglion through the foramen with the aid of the naso-pharyngoscope.

Comprehensive and trust-worthy observation of this region has always been beset with exceedingly great difficulties. To get the proper illumination of the field under observation requires a source of light, the equal of which has not, as yet, been devised. Further, the inspection of small depressions, or fissures, as well as of areas lying beyond a given angle, is beyond the scope of the post-nasal mirror. The inspection of the interior of a sinus by means of a mirror is unsatisfactory.

Small amounts of very thin secretion coming from a sinus are at times impossible of detection, now and then because of anatomical conditions, or, again, at times when the secretion may be wiped away through the act of deglutition, as recorded by Sluder before the American Laryngological Association, May 12, 1914. These thin elusive streaks of secretion may often be seen through the naso-pharyngoscope descending on the septum anterior to the plica septi, or may be seen definitely pouring out of one of the fissures.

Observations made on the cadaver with Sluder have shown that a small amount of thin secretion in a moist nasal cavity will soon spread by dilution with the general moisture, so as to be impossible of recognition in any part except at the ostium of the out-pouring sinus. Such obscure cases examined with the naso-pharyngoscope often give definite diagnostic results.

After any operative procedure in the posterior district of the nose, either at the time of operation under propitious setting or later, much valuable information may be obtained concerning the

district operated. Examination of the posterior region of the nose with the pharyngoscope will give us a comprehensive idea of our intra-nasal surgical technic. Following a post-ethmoidal operation we can determine satisfactorily the thoroughness with which we have opened these cells which was not possible under the older methods of examination. I have, for example, examined post-operative results of the Hajek radical post-ethmoidal and sphenoidal operations as well as healed cases of radical external operations and found that when compared, by examination with the naso-pharyngoscope, the intra-nasal methods appeared to be just as comprehensive and as radical in points of primary execution and of final results as the external operations. The destruction of every ethmoidal cell appears, from a study of the anatomy, practically impossible, but the thoroughness of drainage secured is easily determined by these means.

The pharyngoscope need not be used to determine the extent of the opening in the anterior wall of the sphenoid, but if slipped into the sinus itself we may learn the extent of that sinus, the extent and nature of the pathological condition, and whether suppurative or hyperplastic. Especially is this of importance where a sinus is being opened for the relief of headaches, and particularly those forms of headaches which are thought to originate in a non-suppurative condition of the sinus. Then again by inspection of the interior of the sphenoid, it is often possible, for instance, to make out the marking of the Vidian nerve on the floor of the sinus. It appears as a ridge near its outer wall, or it may appear, as I interpreted it in one case, to be merely enclosed in a fold of the mucous membrane. Such a Vidian nerve passes through the sinus unprotected by a bony canal, a condition ordinarily easily recognized. I have seen instances of this in macerated anatomical specimens.

The marking of the second division of the fifth nerve is often quite plain; it may appear as a welt on the lower half of the outer wall of the sinus when the sphenoid is large, and can be easily made out. The marking of the optic canal, when present, is placed in the upper outer anterior angle of the sinus. The groove formed by the carotid artery does not always appear as an ascending welt, as one might expect, but more as one running in an antero-posterior direction. Prolongations of the sphenoidal sinus into the anterior-clinoid process, or into the pterygoid process, which may fill with secretion, have been diagnosticated.

Considerable practice and repeated observations only, will lead to a correct interpretation of the anatomic markings and much of this should in the beginning be carried out on the cadaver. For this purpose the cadaverous material may first be stained with an ammoniacal solution of carmine, for the natural coloring of living tissue is greatly missed in the cadaver and often leads to considerable confusion.

An inflammatory action on the outer wall of the sinus, involving the district of the nerve trunks, will be readily seen to be of diagnostic and prognostic value. Thus I have seen a case, where an inflammatory action transpired in this region and was accompanied by painful symptoms referable to the underlying nerve trunk, which symptoms increased or decreased with the severity of the localized inflammatory action. In another case, with rapidly failing vision, I saw at the time of operation the signs of inflammation localized to the optic canal. It proved controllable by treatment and quickly showed improvement in vision. A subsequent coryza produced a re-infection of the same part of the sphenoidal sinus and the acuity of vision in that eye at once decreased again.

Up to the present time, to the best of my knowledge, a hyperplastic sphenoiditis has been diagnosticated only by inference. In fact, St. Clair Thomson, Skillern, and Ballenger, in the latest editions of their text-books, failed to make mention of any such condition within the sphenoid. Zarniko, Hajek and Uffenorde, while conceding the possibility of such a condition, have as yet not made the observation during life or on the cadaver. They have diagnosticated it by inference. Sluder reported such cases in 1912 before the American Laryngological Association with the clinical diagnosis definitely made. By means of the naso-pharyngoscope he might have diagnosticated it with greater ease.

I have seen several such cases. Polyps and polypoid degeneration of the sphenoidal mucous membrane have been observed at the time of operation. Usually such cases bleed very little, leaving the lens of the pharyngoscope unsmeared at the time of its introduction into the sinus, and the field of operation bloodless.

As is known, frequently following intra-nasal operations, well-made openings are apt to close up and landmarks become obliterated through new growth of bone, or by traumatic periostitis. In all such cases the naso-pharyngoscope will aid in ascertaining

the exact conditions and in clearing up the extent and type of the pathological process.

A defect of the instruments at present is, that the field of vision is limited because of the lamp being situated at the distal point with the lens fully 12 mm. from the tip. This makes it impossible to obtain a straight-ahead view of the interior of a sinus. Further, a point becomes visible only by virtue of the fact that the line of vision is 30 degrees to each side of a perpendicular arising from the center of the prism. The distance from the center of the prism to the tip, (12 mm.) taken as the base of a right-angle triangle with a 60 degree angle for its hypothenuse, will establish its altitude approximately at 2 cm.; so that objects closer than 2 cm. to the shaft at the tip are not within the field of vision. Furthermore, a distance of 12 mm. from the tip of the instrument to the center of the prism at present occupied by the lamp, necessitates a sphenoidal sinus of that much or more antero-posterior diameter to admit of intra-sphenoidal observation.

I have personally endeavored to have some of these defects eliminated by the construction of a new instrument. This instrument is now in the experimental stage of construction.

402 Lister Building.

Operation for Correcting Aquiline Nasal Deformity. O. A. LOTHROP. *Boston Med. and Surg. Jour.*, May 28, 1914.

In this paper Lothrop offers a new method for correcting an aquiline nasal deformity by the intra-nasal route.

First the triangular cartilaginous septum is pared down submucously along the anterior and inferior borders to fit a smaller straight nose. Then V-shaped sections of bone are removed subperiostially along the naso-maxillary sutures, and the nasal bridge fractured back and down to the new alignment. Lastly an adhesive strip along the dorsum of the nose keeps the tip up and back until union takes place.

The elasticity of the tissues take up the resulting redundancy. Illustrations give in detail the different steps and show a nice post-operative result. BERRY (MOSHER).

TUMORS OF THE UVULA WITH REPORT OF A CASE OF PAPILLOMA OF UVULA.*

DR. P. SAMUEL STOUT, Philadelphia.

Tumors of the uvula are not very numerous. I had hoped to report only those which were of the uvula alone, but I found that at present it would be a difficult matter to separate the tumors of the uvula from the tumors of the uvula and soft palate. However, I have tried not to include the tumors of the soft palate if the uvula was not involved. I did not include edema or hematoma of the uvula among the tumors. It was somewhat difficult to separate the epitheliomas from the carcinomas; so they were all placed under the same heading. No sarcomas of the uvula were found.

CARCINOMA:† 1896, Newman, one case. 1899, Zurakowski, one case. 1899, Lennox Brown, two cases. 1901, Oppenheim, one case. 1901, McCaw, one case. 1901, Theisen, one case. 1902, Raynor, one case. 1905, Freedman, four cases. 1905, Harmon-Smith, one case. 1908, Milligan, one case. 1909, Downie, three cases. 1910, Holmes, one case. *To which might be added*: 1905, Yamagama, one case. 1908, Theisen, three cases. 1909, Piernazels, three cases. 1913, Trusoff, one case.

PAPILLOMA OF UVULA: 1888, French, one case. 1893, Wagner, one case. 1893, Guezzie, one case. 1898, Natier, one case. 1903, Recanatesi, one case. 1905, Nakamura, one case. 1907, Bernex, one case. 1909, Halasz, one case. 1910, Coleman, one case. 1913, Tschiasny, one case. 1915, Stout (P. S.), one case. (reported in this paper.)

ANGIOMA OF UVULA: 1891, Chipault, one case. 1910, Onodi, one case.

FIBROMA: 1903, D'Aguanno, one case. 1903, Court, one case.

PAPILLOMA OF UVULA: (History taken November 21, 1912. Tumor removed at the same time). Miss B. S., age 14 (colored), came to Philadelphia from Virginia two years ago. She had always been well except four years ago, when she had diphtheria. Mother and father healthy; no history of tumors. With the ex-

*Read before the Philadelphia Laryngological Society, January 5, 1915.

†Primary malignant carcinomas as reported by Holmes, Annals of Otology, 1910.

ception of the mass in her throat, of which she complained, she appeared to be a perfectly healthy girl.

About four or five months ago, she noticed something go down her throat when she swallowed and come up again when she would hawk, cough or gag. This did not seem to interfere much with talking, eating, etc., but lately when she would cough it up it would fly out and strike her front teeth, and at times even come out between her teeth. For this annoyance, she consulted a physician.

Examination: A mass was found hanging to the end of a very long uvula. It moved from its position on the tongue down into the esophagus and would fly up again on coughing and strike

Figure 1. Papilloma of the uvula.

the front teeth and then lay on the tongue. The mass was as large as an almond and created considerable wonder why it did not give more symptoms of discomfort.

The mass was immediately removed under local anesthesia, and about half of the uvula was taken with it. Microscopic examination showed it to be a papilloma. The patient was seen one year later; no recurrence.

In conclusion I would say that I do not think that this list of tumors of the uvula is complete, but would ask any who knows of any more to communicate with the writer.*

4701 Chester avenue.

*Free use was made of the Index-Medicus of "The Laryngoscope," of the "Jour. A. M. A." and of the "Annals of Otology."

ANGIOMA OF THE UVULA.

DR. MAX A. GOLDSTEIN, Saint Louis.

Angioma in the upper respiratory tract is a pathological entity not uncommon in the nasal cavity, the tongue, and especially the lip, but of rather infrequent occurrence in the uvula.

The following case of angioma is of especial interest because of its localized involvement of the entire uvula, operative technic for its removal, and the end-result:

Miss F. W., aged 25, a school teacher in a small Illinois town, presents the following history: Rheumatism at 4 years of age, affecting the lower extremities; measles at 16; recurrence of rheumatism at 18. No tendency to constipation; no throat trouble, irregularity of circulation, or any other condition, localized or general, that may have any bearing on the development of such a vascular neoplasm in the uvula. Family history good; parents have no constitutional diseases. Maternal grandfather had growth on cheek that may have been carcinomatous; sister had some cervical adenitis. The patient is not a singer nor does she use her voice excessively.

Present history: About seven or eight years ago the patient felt a roughness of the throat near the base of the tongue. Later there seemed some difficulty in free nasal respiration. Five years later, deglutition seemed impaired, becoming more pronounced from year to year. Last year she contracted an acute coryza with subsequent hoarseness of a few days' duration. Several months later there was a recurrence of the hoarseness that continued for several weeks. An enlargement of the uvula, with sensation of thickness on swallowing was noticed.

After receiving general treatment for some weeks the patient consulted me for the definitely localized tumor of the uvula which had now grown to sufficient size to impair speech, to cause frequent regurgitation of fluids through the nose, and to excite a more or less constant, short cough by the pendant mass of the uvula coming in contact with the posterior pharyngeal wall and base of tongue.

The general condition of the patient was good. There were no vascular, lymphatic or glandular abnormalities found upon careful physical examination.

Plate I, Figure I. Angioma of the Uvula.

This plate illustrates Dr. M. A. Goldstein's report of cases of Angioma of the Uvula. (See page 90).

On inspection the uvula was seen considerably enlarged in size, tortuous in outline, mottled blue-red in color, with injected, distended vessels shining through the mucosa.

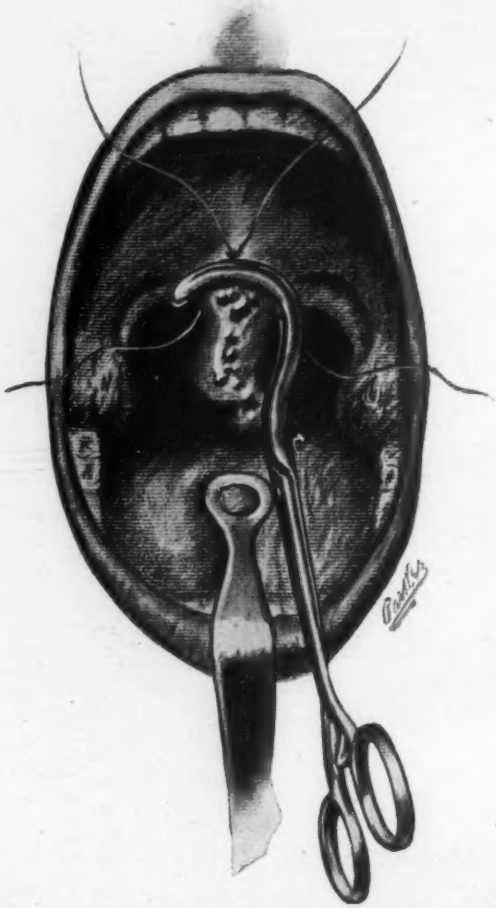

Figure 2. Operative technic for removal of angioma of uvula. Special clamp forceps and double ligatures in position.

The most pronounced varicosities appeared about the tip and extended along the median line of the anterior surface into the region of the soft palate and to a point about ⅜ inch beyond the line of the free edge of the arch of the faucial pillars. On palpation this tumor-

mass was found to be quite indurated, nodular, and about ¾ inch in the antero-posterior diameter of the uvula at its base.

The macroscopic appearance of this neoplasm may be best demonstrated by an inspection of the color-plate herewith presented,

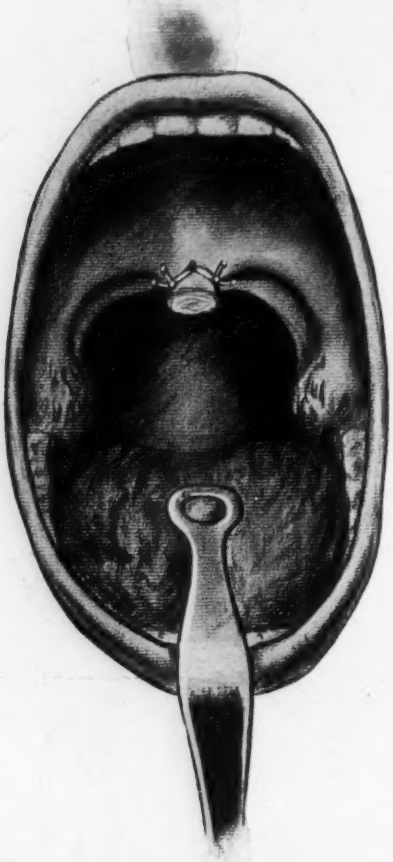

Figure 3. Amputated stump of uvula with sutures fixed.

for which I am indebted to my former assistant, Dr. I. D. Kelly, Jr., who has made a careful drawing from life. We have endeavored to reproduce the actual colors of the neoplasm in the color-print.

This angiomatous tumor was successfully and bloodlessly removed under local anesthesia at one sitting, and the patient made an un-

eventful recovery. Plate 2 illustrates the simple technic of this operation.

The tumor-mass was anesthetized by novocain-adrenalin hypodermic infiltration. An eight-inch, widely curved, uterine hemostat forceps was clamped well above the upper tortuous vessels, a large aneurysm needle threaded with a double, strong silk suture was passed from behind through the palate and two ligatures firmly tied on either side, the outer curve of the clamped forceps preventing the slipping of the ligatures. With a bistoury curved on the flap I removed the tumor, using the lower curved edge of the clamp as a guide.

As an additional precaution to prevent hemorrhage the clamp was left in position for several hours until the effect of the local infiltration of adrenalin had been somewhat dissipated. Knowing the peculiar vascular character of this neoplasm I anticipated some trouble from hemorrhage and took these unusual precautions of using a special clamp, double ligatures, and absolute rest.

The operation was bloodless, the stump was clean, the sutures remained in fixed position until their removal on the third day, the healing was smooth, and there is absolutely no deformity of the soft palate or faucial pillars as might have been expected from the heavy sutures and cicatrization.

This operation was performed in the spring of 1910, the patient has been in perfect health since and has continued her vocation as a school teacher. There has been no recurrence of the neoplasm nor any tendency to varicosities of any of the tissues of the oral cavity. Speech is practically normal, even though the uvula is completely amputated. There is excellent flexibility of the free edge of the palate externally across the medial line.

3858 Wstminster Place.

Tumor of Soft Palate Consisting Mainly of Salivary Gland Tissue.

GUTHRIE. *Jour. Laryngol., Rhinol. and Otol.*, Feb., 1914.

Boy of 8 years had pear-shaped tumor hanging on right side of soft palate. Tumor measure 9 mm. longitudinally and 6 mm. transversely. ED.

CAVERNOUS ANGIOMA OF THE TONGUE.

DR. H. ARROWSMITH, Brooklyn, N. Y.

The patient was first seen by me in November. She was a girl, 12 years of age, who had from birth a tumor of the left side of the tongue. On several occasions she had bitten the tongue and started more or less severe hemorrhages which were at times difficult to control. There was a tumor occupying the middle third of the left half of the tongue,—very well shown in the pictures,—which could be emptied by pressure and which remained flaccid as long as the afferent blood-supply was stopped. The diagnosis of aneurysmal varix was made from the physical signs. The patient

Figure 1.

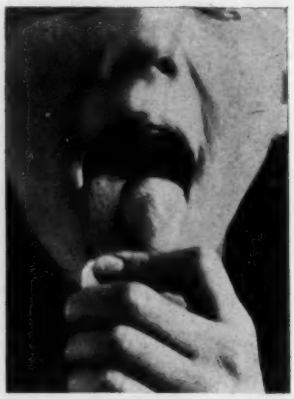

Figure 2.

was operated at St. Peter's Hospital, Brooklyn, on December 17, under colonic anesthesia (after Gwathmey). A deep silk suture was passed through the left lateral half of the tongue behind the swelling, to control possible bleeding; four similar sutures surrounded the tumor, which were not tied until the relatively solid tumor was dissected out, and then served to approximate the edges of the mucous membrane. A week later, all the sutures were removed, the wound being entirely healed. Dr. Murray pronounced the tumor a cavernous angioma. The tumor is, to my knowledge, the largest growth of the kind that has been reported in this location.

170 Clinton Street.

SCOPOLAMIN IN NOSE AND THROAT OPERATIONS.*

DR. MYRON METZENBAUM, Cleveland, Ohio.

Scopolamin or hyoscin hydrobromid has been in constant use for a quarter of a century in institutions for the care of the nervous and insane. It is the best of cerebral sedatives for controlling and quieting alcoholic and traumatic delirium.

It was from my knowledge of its benefits in these conditions that I first administered scopolamin in 1900, to modify or control the delirium of the excitation stage in ether anesthesia. From 1900 to 1910 I administered a physiological dose of scopolamin 1400 times preliminary to operating under ether, nitrous oxid oxygen gas, cocain or novocain, and reported the results in the *Ohio State Medical Journal*, December, 1910.

During the past five years my observations are limited entirely to the administration of scopolamin given before 2200 operations on the ear, nose, throat and neck.

Adults receive 1-100 gr. usually by mouth or it may be given hypodermatically, one-half to one hour preceding all operations under local or general anesthesia.

Children are given 1-200 gr. coated pill with a little water one-half to one hour before operating. In children a hypodermic is only used when immediate effects are required and morphin is never combined with it.

Scopolamin acts as though it was made up of two radicals, one similar to atropin or belladonna. Since children tolerate belladonna very well this may explain why they tolerate scopolamin so well.

The atropin radical, like atropin itself, prevents reflex inhibitory stimuli coming through the superior laryngeal nerve and its branches to the vagus. It is, therefore, of value if given before operations for the removal of adenoids, tonsils or operations around the base of the tongue, thyroid gland or larynx, in bronchoscopy, esophagoscopy and especially in removing foreign bodies from the pharyngeal or laryngeal region when there is considerable traction on the tongue.

The atropin radical does not check the secretion of the kidneys but it holds in check the mucous secretion during ether anesthesia.

In bronchoscopy there is almost no secretion to wipe away. In operations with local anesthesia on the throat there is almost no saliva to annoy. In operations on the nose the abundant nasal secre-

*Read before the Columbiana County Medical Society, February 9, 1915.

tion is lessened and the usual profuse discharge following any extensive nasal manipulation or operation is held in check for several hours.

The other radical of scopolamin is a decided brain sedative for after the administration of a physiological dose of scopolamin the pre-operative nervous fear and irritability is changed to one of calm and quietude, so that when desirable the patient may be placed directly on the operating table without manifesting the usual fear and excitation. Scopolamin places the patients under a mild anesthesia; therefore, in administering ether or nitrous oxid oxygen gas they go under the general anesthetic more rapidly, with less resistance, requiring less anesthetic to maintain an even anesthesia, awakening more rapidly, at the same time the anodyne effect lasting for several hours. In nitrous oxid oxygen gas, scopolamin renders greater muscular relaxation and at the same time gives a better vaso-motor tone.

In operations on the nose and throat under cocain or novocain the preliminary administration of scopolamin is of the greatest value. The usual fretful, excited, restless patient becomes quiet, interested and helpful, so that in the removal of tonsil or foreign bodies from the throat the patient will often hold the tongue-depressor and be entirely free from the usual constant desire to spit, cough, gag and explode their breath.

In nasal operations the preliminary administration of scopolamin lessens the amount and strength of cocain or novocain required and anesthesia of the bony areas is decidedly more effective, as in the opening of the antrum or sinuses.

When scopolamin is administered in physiological doses it seems free from any immediate or remote detrimental effects, while its benefits are to quiet the patient, benumb his sensibilities and lessen his irritability to such a degree that he requires less local or general anesthesia to complete the operation.

768 Rose Building.

Antitoxin Intravenously in Laryngeal Diphtheria. S. NICHOLSON, *Bull. of Med. and Chir. Fac. of Md.*, Oct., 1914.

Report of a series of cases in which the intravenous use of antitoxin seemed to act much more rapidly and surely, and apparently materially reduced the mortality rate from the disease. PACKARD.

STREPTOCOCCUS VIRIDANS IN ITS RELATION TO INFECTIONS OF THE UPPER RESPIRATORY TRACT.*

DR. RUSSELL L. CECIL, New York City.

During the past decade numerous efforts have been made to devise a satisfactory classification of streptococci, most of them being based on the carbo-hydrate fermentation test.

Schottmüller's classification of streptococci, based upon the appearance of the colonies on blood agar, is at present perhaps the most practical if not the most accurate classification of these bacteria. He divides them as follows: 1. Streptococcus hemolyticus. 2. Streptococcus viridans (mitior). 3. Streptococcus mucosus.

Schottmüller's work has been followed by a number of similar studies in which the reaction on blood has been used as a basis for classification. Most of these investigators find that clinically the streptococcus hemolyticus and streptococcus viridans produce more or less characteristic lesions, the former being associated with suppurative or phlegmonous inflammation, the latter usually with milder catarrhal processes.

During the last two years I have been making a study of the bacteriology of infections of the upper respiratory tract, with special reference to the role played by streptococcus viridans in these cases. The object of the investigations has been to determine: (1) The incidence of the streptococcus viridans in infections of the various parts of the upper air passages and their adnexa. (2) The clinical features of those infections in which the streptococcus viridans was the predominant organism. (3) The relation of such infections to arthritis, endocarditis and other systemic disorders. (4) The value of autogenous vaccines in their treatment and prevention.

More than a hundred cases have been studied, but for various reasons only eighty-nine have been included in the present report. The material for this study has been obtained for the most part from the medical clinic of the Presbyterian Hospital.

Without exception the original cultures have been taken on glucose blood agar plates (in all cases human blood) defibrinated by sodium citrate or by shaking with glass beads. A special

*Read at the meeting of the New York Academy of Medicine, Section on Laryngology and Rhinology, December 23, 1914.

effort was made in this study to determine the predominating organism; while pure cultures were rarely obtained it was found that with careful technic one, or at most two organisms usually far out-numbered any others that might be present and in so far as they predominated could be looked upon as the probable exciting agents in the infection. In those few cases where pure cultures were obtained there was no doubt as to the character of the infection. In the others, the presumption was, of course, in favor of the predominant organism, but one could no longer be sure that the infection was a pure one.

Before proceeding to a consideration of the above-mentioned problems a brief description of the streptococcus viridans might not be out of place. Streptococcus viridans in a typical form is a very small gram positive diplococcus which grows in pairs or short chains. On glucose blood agar, colonies on the surface develop slowly as minute round, grey dots, with a narrow halo of green. On plain or ascitic agar the streptococcus viridans forms small, grey colonies which may show adherence to the medium and considerable variations in size, so that one often suspects the culture of being contaminated. In broth there is usually produced a slight turbidity with a flocculent or granular sediment in the bottom of the tube; litmus milk is coagulated; inulin may or may not be coagulated, usually not. Streptococcus viridans is not soluble in bile or bile salts.

Incidence: Streptococcus viridans has come to be associated in the minds of many almost exclusively with chronic infectious endocarditis. While it is the most frequent exciting agent in this disease, it should more properly be thought of as an inhabitant of the mouth and upper respiratory tract. It can be isolated from practically every normal mouth and throat. The importance of the streptococcus in infections of the upper respiratory tract has long been recognized, but comparatively little has been done to distinguish the various types from one another. Streptococcus hemolyticus, streptococcus viridans, streptococcus mucosus and the pneumococcus may all be found in healthy mouths, the viridans being usually the most abundant. In spite of this fact, however, most investigators of the bacteriology of the infections of the upper respiratory tract have been content to throw all streptococcus infections into one group, so that comparatively little is known of the relative importance of the different types in these infections. Schottmüller in his orignal article found streptococcus viridans in tonsillitis, conjunctivitis,

acute and chronic rhinitis, otitis media, empyema, pericarditis, lung abscess, endocarditis, acute enteritis and other abdominal inflammatory conditions; and recent studies of Rosenow, Camac, Billings and others on the relation of oral sepsis to chronic arthritis and the demonstration by Rosenow of streptococcus viridans in the joints of rheumatic fever, indicate what an important role this organism and its variants play in infections of the mucous and serous surfaces.

In the eighty-nine cases of infection of the upper respiratory tract, which have received bacteriological study, fifty, or 56.2 per cent, have shown a predominance of streptococcus viridans on blood agar plates. It seems rational in an investigation of this nature, where, even with scrupulous technic, colonies of several species are often found on the plate, to attribute chief importance to the organism or organisms which are most largely represented. This is particularly true where the bacteria in question are hard to cultivate. For example, it would be much more significant if a plate showed 90 per cent of its colonies to be bacillus influenzae or streptococcus viridans, than it would be if the plate was overgrown with B. proteus or staphylococcus albus. In the latter instance one would hesitate about making a positive bacteriological diagnosis, whereas in the former case, he could feel fairly sure that the specific organism had been discovered.

In the present study I have given especial attention to the *number* of colonies of each species present. My results, therefore, can hardly be compared with those of previous investigators who have usually set down merely the names of the organisms present without any reference to which were predominant.

The streptococcus viridans has been predominant in more than one-half of the cases studied. It has also been present, but not predominant, in a good many others. Next to the streptococcus viridans in frequency was the closely related pneumococcus which, including streptococcus mucosus, was predominant in eighteen cases, or 20.2 per cent of the series. The third in order of frequency was the streptococcus hemolyticus which was predominant in six cases, (6.7 per cent). These three organisms, therefore, were apparently the most active factor in about 83 per cent of the cases studied. The remaining 17 per cent was divided between B. influenzae, micrococcus catarrhalis, B. Friedlander, B. septus micrococcus, paratetragenous, staphylococcus aureus albus and citreus. Some form of staphylococcus

was encountered in almost every case, but only in a few instances was it predominant. The staphylococci appear to play a very insignificant role in infections of the upper respiratory tract.

Streptococcus viridans in infections of the tonsils: The streptococcus is by far the commonest micro-organism found in infected tonsils, both acute and chronic. This fact is so widely known that no reference to the literature is necessary. The distinction, however, between the viridans and other types of streptococci has not been usually made. My own studies of the tonsillar flora have been confined to cultures taken from that organ *in situ*.

Cultures were obtained as follows: The tonsil was wiped off with a sterile swab, and a sterile platinum wire inserted as deep as possible into one of the crypts. The material removed was then spread over the surface of several blood agar plates with a sterile glass rod.

I have examined the tonsils of twenty-one patients with more or less evidence of tonsillar disease. In sixteen of these streptococcus viridans has been present in large numbers, sometimes in pure culture. In the remaining five cases the pneumococcus and streptococcus hemolyticus predominated.

The cases of acute tonsillitis in which streptococcus viridans has been the predominant organism have been of a mild or only moderately severe type. The streptococcus hemolyticus is usually found with the tonsillitis of scarlet fever and peritonsillar abscess. I have seen several severe cases of tonsillitis from which pure cultures of the pneumococcus were obtained. Most cases of mild tonsillitis are probably due to streptococcus viridans, but the clinical picture is certainly not characteristic enough to allow of a bacteriological diagnosis without a bacteriological examination.

It should be added that the smears made in these cases corresponded with the cultures, showing pus cells and diplococci in short chains.

In the one case of this group in which autogenous vaccine was used the response was immediate. A tenacious membrane, which had resisted local treatment for ten days disappeared from the tonsils within twenty-four hours after vaccination and the patient made a rapid recovery.

Acute tonsillitis associated with rheumatic fever: In spite of the well-known association of tonsillitis with rheumatic fever, I know of no careful or extensive study of the bacteriology of

the tonsil in this connection. My own series consists of only five cases. Cultures from the tonsils in all of these showed streptococcus viridans as the predominant organism. In one case it was present in pure growth.

Unfortunately no cultures were made from the joints in any of these cases. Rosenow has recently cultivated from the joints in rheumatic fever streptococci which produce green on blood agar and "after prolonged cultivation come to resemble streptococcus viridans in morphology, in cultural and pathogenic qualities." Rosenow's organism is probably identical with Poynton and Pane's streptococcus rheumaticus. In view of the widely accepted theory that the tonsil is the portal of entry for the organism of rheumatic fever, it is interesting to find that the streptococcus viridans is so constantly present in the tonsils of these cases. Vaccines were not used in any of the cases, as they all responded well to salycilates.

Two cases of uncomplicated chronic tonsillitis gave pure growths of streptococcus viridans but presented nothing of particular interest except in indicating that streptococcus viridans is a common finding in chronic tonsillitis.

The tonsils in two very typical cases of sub-acute infectious endocarditis showed no external signs of disease, but cultures from the crypts gave practically pure growths of streptococcus viridans and both patients gave histories of recent "colds," which may have been localized streptococcus viridans infections of the naso-pharynx and tonsils.

The strains of streptococcus viridans from the tonsils in these two cases reacted on culture media in the same way as those recovered from the blood. Morphologically, however, the cocci from the tonsils were somewhat larger than those from the blood.

Autogenous vaccines, both the killed and the sensitized living, were administered in both these cases. At times the vaccine seemed to reduce the temperature, but the effect was only temporary, and both patients died.

There were three cases of chronic tonsillitis associated with chronic arthritis, in which streptococcus viridans predominated in cultures from the tonsil. In these three cases the existence of tonsillar disease was quite evident. In every instance smears from the tonsillar crypts showed pus cells in addition to Gram positive diplococci. In the first case, the tonsils were removed and the patient's joints began to improve immediately. In the other two, the tonsils were not removed and the condition of

the patients remained unchanged, though one of them received large doses of autogenous vaccine. The first case was much less advanced than the other two, hence was more amenable to treatment.

Two of the cases in this series illustrate a condition which I have observed several times, namely, the combination of both pyorrhea and tonsillitis with arthritis.

Streptococcus viridans in infection of the alveolar sockets: The only extensive study of the bacteriology of pyorrhea is that of Goadby, who in ninety cases found the streptococcus in fifty-five and the staphylococcus in sixty-three of them. His cultures were taken on slant agar. No one organism has ever been held responsible for pyorrhea, but Ankovy thought that the disease was probably of streptococcic origin. In the more recent studies of oral sepsis and its relation to systemic disease, some form of streptococcus has usually been found present, often in association with B. fusiformis and spirochetes. My own series comprises twelve cases.

From all of the twelve cases studied an abundant growth of streptococcus viridans was obtained, in some cases practically pure. One of these cases was associated with an acute polyarthritis; four of them with chronic arthritis; two with chronic nephritis; and one with chronic infectious endocarditis. Proper treatment of the teeth and autogenous vaccine produced great improvement in two of the chronic arthritis cases, and in one of the nephritis cases.

Streptococcus viridans infections of the pharynx and nasal cavities: The bacteriology of coryza has been extensively studied but in spite of this there still remains considerable disagreement and doubt on the subject. Cultures from coryzas in the acute stage are often sterile, while in cultures taken in the subacute or chronic stage, there are often several types present, so that it is difficult to decide which organism is the causative factor.

Various bacteria have been considered as more or less specific for colds. Cantley in 1894 described a small bacillus, since known as B. septus, which he considered the exciting agent in the majority of colds. White and Walter have also attributed considerable importance to B. septus in the etiology of colds. Recently Tunnicliff has described a small spirochete which she has been able to isolate from acute and chronic coryzas. Allen makes the statement that the streptococcus is the most frequent

cause of "purulent nasal catarrh," referring doubtless to subacute and chronic coryzas. Numerous writers have shown that the normal nasal cavity is sterile or practically so. Schottmüller in his original study of streptococcus viridans frequently found this organism pure in acute and chronic rhinitis.

The streptococcus viridans, like the pneumococcus, is an inhabitant of the normal mouth. It is usually easy to isolate it on plates from any healthy pharynx.

I have studied only a limited number of coryzas, fourteen in all. Before taking cultures from the nose a plug of absorbent cotton soaked with 95 per cent alcohol was inserted in each vestibule and allowed to remain there several minutes. When the plugs had been removed a sterile nasal speculum was inserted and several loops of secretion from the middle meatus were carefully removed with a platinum wire and smeared over the plates.

Cultures from the pharynx were taken with a sterile swab, after the throat had been well gargled with sterile salt solution. Of the twelve cases so studied, five gave evidence of being of streptococcus viridans origin.

Streptococcus viridans coryzas nearly always start in the throat and extend upward or downward or both. They show a distinct tendency to recur. This was very noticeable in two of the cases. In one case autogenous streptococcus viridans vaccine was given a thorough trial and proved most effective in protecting the patient against subsequent infection. The inoculations were started in January and were repeated once a week through the remainder of the winter and early spring.

Streptococcus viridans in infection of the accessory sinuses: It has been shown by Tome that healthy sinuses are practically always free from bacteria. Herzfeld and Hermann studied the bacteria in ten cases of antral empyema and found non-virulent streptococci (probably viridans) in eight of them. In six cases the streptococcus was present in either pure culture or was noted as the predominant species. The virulence of all was tested in rabbits and mice and proved non-virulent. Howard and Ingersoll, in eighteen cases of sinus infection, obtained the streptococcus in half of them (four times in pure culture) and the pneumococcus in four. Lichtwitz, in a study of sinus infections, concludes that the streptococcus and staphylococcus are responsible for most sinus infections. Lewis and Turner's study of the bacteriology of sinus infection covers seventy-four cases. In the acute cases, streptococci were present in 60 per cent; in the

chronic cases in 80 per cent. The pneumococcus was found in almost as large a percentage.

Allen's results in thirty cases of sinusitis differ from previous studies in showing a high incidence of B. influenzae, (73 per cent). The streptococcus or pneumococcus or both were present, however, in 80 per cent of the cases also. I have studied the flora in nine cases of sinus infection. The cultures were obtained under strict bacteriological technic. In all but one of the cases I was assisted by a laryngologist who aspirated the pus from the sinus with sterile instruments.

In three cases I found the streptococcus viridans predominant. One was an antrum infection, one frontal, and in the third all the sinuses were involved. In the last, the patient also suffered from severe attacks of bronchial asthma.

It is often difficult to cultivate the streptococcus viridans from the sinuses, even when the organisms can be seen in smears. This was my experience in two cases where repeated cultures were sterile. This is particularly liable to occur if the pus has been allowed to remain for several days in the sinus. Freshly secreted pus is much more likely to give a growth than old pus in which presumably the bacteria have been destroyed by bactericidal substances.

Chronic sinus infections of whatever origin do not yield readily to vaccine treatment. One of my cases was considerably relieved from frontal headache by large doses of autogenous streptococcus viridans vaccine. The discharge was diminished but did not entirely disappear.

In the case of sinusitis associated with asthma there was considerable sensitiveness to streptococcus viridans vaccine. An injection of 100 million produced within five hours a very marked general reaction which lasted twenty-four hours. There were general malaise, fever, and increased secretion from the sinuses. Fortunately this sensitiveness has now disappeared, so that he is able to take doses of two billion or more without trouble. The asthma has improved, but the sinuses remain about the same.

I have studied the bacteriology of only one case of dacryocystitis, and this proved to be a pure infection of streptococcus viridans. Removal of the sac resulted in complete cure.

Streptococcus viridans infections of the middle ear are unusual. Streptococcus hemolyticus or mucosus, or the pneumococcus are more frequently found in the acute cases and staphylococcus

aureus or albus in the chronic. Out of thirteen cases studied, I have encountered only one of streptococcus viridans otitis. This was in a boy, 5 years old. The infection ran a short, mild course, and the mastoid was not involved.

The bacteriology of bronchitis has been studied thoroughly by many observers, but most of these studies were made before blood agar media came into general use. I have not investigated the literature earlier than 1900, but since that time there have been a number of careful studies of the subject. Practically all of these investigators have emphasized the importance of streptococcus and pneumococcus in the etiology of bronchitis, but differentiation of the various types has not been made. During the past two years I have studied the sputum from fourteen cases of bronchitis (acute and chronic). In eight of these the streptococcus viridans was predominant or present in pure culture.

Acute bronchitis of streptococcus viridans origin is usually mild as all other infections with the organism tend to be. Three out of the four cases studied were subject to repeated, acute attacks—again illustrating the failure of the body to develop a permanent immunity against this organism. Only one of the patients was vaccinated. He received autogenous streptococcus viridans vaccine every five to seven days through the late winter and spring, and has had no more infections of any kind since the vaccine treatment has been instituted.

Four of the chronic bronchitis cases showed a predominance of streptococcic viridans in their sputum. When I compared these four cases I was surprised to find that they all had with their cough more or less well defined asthma. This is probably a coincidence, but agrees with the work of Allen, who found streptococci in the sputum of practically all asthmatics. Vaccine was employed in only one case of this series. Autogenous streptococcus viridans vaccine was given through the entire winter and by this means the cough was kept well in control. When the vaccine was omitted for any length of time, however, the symptoms recurred.

If one studies the general clinical course of streptococcus viridans infections of the upper respiratory tract, they are seen to have three very definite characteristics: (1) They usually run a mild course. The streptococcus viridans is esentially a germ of low virulence for animals and man alike. In the present series of cases the severe infections have nearly always been caused

by the pneumococcus or the streptococcus hemolyticus. (2) They have a tendency to become chronic. This applies particularly to pyorrhea, tonsillitis and sinusitis. Streptococcus viridans bronchitis and rhinitis often run a chronic course also. (3) They are followed by little or no immunity and are therefore quite prone to recur at frequent intervals. This trait, well illustrated in the coryza and bronchitis series, follows from the low virulence which the organism possesses. Its metabolism disturbs the body so little that only a small amount of protective substances is developed against it.

The present study gives some weight to the idea that local streptococcus viridans infections play an important part in the etiology of certain systemic diseases, especially arthritis, endocarditis and nephritis. Streptococcus viridans can usually be isolated from the crypts of the tonsil in acute rheumatism. Rosenow has cultivated streptococci from the joints in acute rheumatism, and has found that except for slight variations they differ in no way from streptococcus viridans. Davis found streptococcus hemolyticus more commonly in the tonsils of chronic arthritis and nephritis, but, in my own experience, the viridans is just as frequently found in these diseases.

It is noteworthy that of all the streptococcus viridans infections of the upper respiratory tract, it is almost exclusively those of the tonsils and tooth sockets, (occasionally of the sinuses) that are associated with systemic disease.

There remains to be considered the value of vaccine in the treatment and prevention of streptococcus viridans infections. As a result of the present study I feel no hesitancy in saying that autogenous vaccine may be of great value in selected cases of sub-acute and chronic infection by this organism. Naturally, in those cases where the infection is accompanied by extensive structural changes, as, for example, bronchitis with emphysema or bronchiestasis, old sinus infections with thickened walls, advanced pyorrhea with retraction of the gums, and tonsillitis with hypertrophy or fibrosis the benefit which vaccine can bestow is limited.

It is in the prevention of recurrences of these infections that vaccine is most valuable. In several cases in my series, patients who had been subject to frequent re-infections were successfully carried by means of vaccination through the winter and spring without any further recurrence of these troubles.

Prophylactic vaccination against infections of the upper respiratory tract is a matter which deserves more study. It is rather strange that prophylactic vaccination of dogs against distemper should be so generally in use, while so little effort is being made to protect human beings against coughs and colds. From my own experience, I should favor the view that most people who suffer from frequent colds are susceptible to one particular organism with which they are constantly being re-infected. Moreover, the more carefully one studies these cases, the less weight he attaches to the idea of their being usually mixed infection. It is probably one organism that causes the infection in most cases. The others, being present on the infected surface, multiply in the rich secretions which are poured out, and simply serve to confuse the bacteriological picture. If this is the case there is all the more reason why every effort should be made to discover the offending organism, and if necessary to protect the patient against further infection.

123 East Sixty-second Street.

Tragic Aspects of Whooping-cough. P. H. SYLVESTER, Boston, *Med. and Surg. Jour.*, March 19, 1914, p. 406.

Sylvester reminds us that this disease with its mortality of 7 per cent and its toll of 10,000 in the United States annually, is more to be dreaded than most realize. He reports eight recent cases coming under his observation, seven of which ended fatally and one with its health permanently impaired. He concludes: 1. Certain cases of whooping-cough have symptoms of intra-cranial pressure, best explained on the ground of a cerebral hemorrhage. 2. The hemorrhage appears to be dependent upon the stress of the paroxysm. 3. The symptoms of hemorrhage in these cases pointed to lesions other than middle meningeal and were surprisingly uniform in the—(a) initial convulsion; (b) immediate rise in temperature to a high degree; (c) cyanosis; (d) spasticity rather than paralysis. 4. This type of cases emphasizes the importance of prophylaxis. 5. Treatment should be directed toward at least reducing the severity of the paroxysms. BERRY (MOSHER).

THE TREATMENT OF HAY FEVER BY ACTIVE IMMUNIZATION.*

DR. ROBERT A. COOKE, New York City.

Let us first consider briefly a few of the facts regarding antibody and its relation to immunity and anaphylaxis:

1. *With regard to antibody formation*: It must be borne in mind that any form of foreign protein parenterally introduced within the living body, gives rise to the formation of a specific immune or antibody which exists either attached to certain cells or free. When union takes place between protein and free antibody, there is no clinical evidence of a reaction, but when a union takes place between protein and fixed antibody, a reaction takes place, and the nature of this reaction is determined by the type of cell to which the antibody was attached.

2. *Relation between immunity and anaphylaxis*: They are qualitively identical but quantitatively different. In other words, when there is a large excess of antibody circulating free, we have an immune state; and when there is little antibody, and that for the most part attached, we have the sensitized state.

3. *Duration of immunity*: Immunity in the sense that free excess antibody once present is always present, does not exist. With cessation of protein injection, the body returns to the anaphylactic state, in which it may remain, or to the state of accelerated capacity to form antibody.

HAY-FEVER AND HAY ASTHMA.

While the recognition of protein sensitization in the human is undoubtedly an advance, we still have no conception of the reason why or how a certain group of individuals become and remain sensitized while the deliberate innoculation of foreign protein in other persons leaves them eventually, to all intents and purposes, as unresponsive as though they were never sensitized. This capacity for sensitization in general is unquestionably largely inherited—of 205 cases of hay-fever, 129 or 63.8 per cent, gave a history of some form of protein sensitization in the immediate family, forbears or descendents. On the other hand, of forty-three normal persons only

*Author's synopsis of the paper read before the Section on Laryngology and Rhinology of the New York Academy of Medicine, November 25, 1914.

seven or 16 per cent gave a history of some form of sensitization in the family.

While there is this undoubted inherited capacity for sensitization, the clinical evidence or type of sensitization is individually acquired, as shown by the following example:

A. H., age 26. Maternal grandmother had asthma as a young woman. Mother has hives after eating celery or tomatoes. Mother's sister had autumnal hay-fever. The patient has early and late hay-fever with asthma. Horse, cat or dog cause hay-fever and asthma; fish, clams or strawberries give acute indigestion with vomiting.

Hay-fever occurs in two fairly well defined groups: The spring type beginning May 1 to 15, and ending July 15 to 30. The fall type beginning August 10 to 20 and ending October 1 to 15.

SPECIFIC CAUSES.

EARLY TYPE:—*A. Graminaceae*—Timothy, Wheat, Red Top, Low Spear, June, Sweet Vernal, Orchard, Mullein, Rye. *B. Flowers*—Rose, Daisy, Lilac, Dandelion. *C. Trees and shrubs*—Locust, Chestnut, Pine, Maple, Privet. FALL TYPE:—Ragweed, trifida, artemisiaefolia, Goldenrod, canadensis, framinifolia, nemoralis, Aster, Chrysanthemum, Nasturtium, Clematis, Spartina, Stricta.

Diagnosis. In order to determine the specific factors in any individual case, recourse has been had to the cutaneous reaction. Solutions of pollen protein injected intradermally give rise almost at once, in individuals sensitized to that protein, to the formation of an urticarial wheel surrounded by a distinct zone of hypermia and usually attended by considerable itching of the skin.

Multiple sensitizations: In one sense, practically all hay-fever cases show multiple sensitization, that is, they react positively to more than one protein. Of 205 cases of hay-fever, twenty-one or 10 per cent have both spring and fall symptoms. Of 205 cases of hay-fever, sixty-five or 32 per cent have sensitization to entirely different proteins, as horse, dog, cat, egg, oatmeal, fish, lobster, crab, celery and various fruits or drugs or sachets; and the clinical manifestations may be a urticaria, asthma and angio-neurotic edema, hay-fever and gastro-enteritis.

The pollens of the graminaceae are by far the most important, as far as the early cases are concerned. Patients reacting to one of these group, generally react to all but in varying degrees.

Preparation of the pollen extracts: Dried pollen, or the polleniferous portion of the flower is ground in a mortar with sand using n/200 NaOH .9 NaCl solution). It is then shaken for twenty-four hours—filtered first through sand and then through a sterile Berkefeld filter. The determination of nitrogen is made by the Kjeldahl method, using n/50 solutions for the titration. The nitrogen content is the determining factor for the solution, doses being expressed in fractions of a milligram of nitrogen.

This method seems to give preparations of equal and regular toxicity. The method used by other workers in this field is based upon the weight of pure pollen. These preparations are preserved with ½ per cent carbolic, and if kept in the cold, are fairly stable, although in time a certain change, probably a proteolysis with diminution of toxicity, takes place.

Treatment: The intradermal tests have first to be applied in order to determine the specific etiologic factors in the case.

A. prophylactic. This is by all means the most satisfactory. Treatment is begun about two months before the anticipated attack. Injections are given subcutaneously at weekly intervals, the dose at first being very minute and gradually increasing at each subsequent injection. During the hay-fever season the injections are continued at intervals of from one to two weeks; in all ten or twelve injections are required.

B. Phylactic: Cases that present themselves for treatment during the attack are given minute doses on four successive days, and then continued at intervals from three to five days. In these cases also from eight to ten injections are required.

Case 1: Mrs. W. A. G. Early hay-fever, asthma, phylactic. Patient has very severe hay-fever and asthma.

Attack commences about May 20, reaches its height from June 15 to July 1, and ends about July 15.

Symptoms were severe with asthma when treatment was begun on June 19. The following is an extract from a letter from the patient's husband—a physician:

"The injections were given as per directions, according to the following schedule. The weather was most unfavorable. From June 19 to 27, the temperature was mostly high, and the humidity excessive. It was cool weather around July 1, at which time the habitat was changed from Syracuse, N. Y., to the St. Lawrence River, where, it should be remarked, no immunity has previously been found. In fact, in 1913, on July 5, the worst

asthma ever experienced was noted. On the St. Lawrence the weather has been more agreeable, but the season for grasses is later, and the cottage in which the patient is located had surrounding it several fields of timothy in flower on July 1."

June 18, 1/10 cc. were given; slight reaction; general symptoms, none. June 19, 1/10 cc. were given; no reaction; general symptoms, none. June 20, 1/10 cc. were given; marked reaction; general symptoms, none. June 21, 1/10 cc. were given; slight reaction; general symptoms, none. June 24, 2/10 cc. were given; strong reaction; general symptoms, none. June 27, 2/10 cc. were given; no reaction; general symptoms, none. June 30, 3/10 cc. were given; no reaction; general symptoms, none. July 3, 3/10 cc. were given; strong reaction; general symptoms, none. July 7, 4/10 cc. were given; strong reaction; general symptoms, none. July 13, 5/10 cc. were given; no reaction; general symptoms, none.

June 19, following the first injection, nasal symptoms were somewhat increased, with slight asthma at night. After marked local reaction on June 20, all symptoms greatly improved, and no asthma has been noted since. The symptoms rapidly abated until June 24, as if the season were over, and on June 24, following a strong reaction, they practically disappeared. Since that time the patient has been free from asthma, cough, hoarseness, and has had intermittent nasal discharge with slight lacrimation during periods of great exposure. On July 2, she walked a mile and a half in the country, and returned with only moderate nasal discharge and lacrimation, which disappeared in one-half hour.

Case 2: Mrs. G. M. G. Late hay-fever, prophylactic. Family history, negative. Present: Hay-fever started sixteen years ago. Begins August 20 and lasts to October 10. During all of September it is continuous and severe. Never any asthma. She was for five years in California and abroad where she was free of symptoms. Last year she was in and about New York City and was bothered with the attack of usual severity; five years of freedom had not removed the sensitization. Shell-fish give an intense itch of entire skin with no rash of any sort. Intradermal: Ragweed and goldenrod both positive. Treatment: July 14 to August 12, five injections. No local or general reactions. August 19, sixth injection. Patient sneezed a few times yesterday. August 25, seventh injection. Two days previous a little sneezing and moderate attack for one hour after ride from Albany to

New York. September 2, eight injection. On September 3, bad attack in afternoon while motoring. September 9, ninth injection. Between September 1-9, occasional, slight attack. September 18, tenth and last injection. Since September 9 practically free, though motoring most of the time. After September 18 entirely free.

RESULTS.

In any discussion of results, it is not proper to use the word cure, for the cases once rendered immune do not retain a sufficiently high degree of immunity to protect them the ensuing year. As an exception to this, I have among my records four instances of cases treated one and two years ago, with no treatment since and without a return of symptoms; but certainly this does not hold for the majority of cases. Koessler also reports two instances of a similar kind; and Freeman believes that immunity may last over one year. It is, however, in general true that the cases satisfactorily immunized one season respond more rapidly to treatment the ensuing year. Of the early cases treated this year, the results are as follows: Cases, 64; unreported, 4; reported, 60. Mark improvement in 36=60.5 per cent—includes cases free three to five weeks. Improved, 19=31 per cent. Unimproved, 5=8.5 per cent. Of the late type treated in 1913 (80 cases): Marked improvement, 25 per cent; improved, 50 per cent; unimproved, 25 per cent.

It is not possible to report upon the results of the late cases this year, as the reports are not fully in. The immunization of the late type is evidently more difficult, but this I presume to be due to the fact that pollen is present in the air in much larger quantities, has a somewhat higher degree of toxicity and therefore requires a much higher degree of immunity.

I feel that I should utter a word of caution against the liberal use of this form of treatment in highly sensitized individuals, and particularly in those with an associated hay-asthma, for the intense reactions that will follow the use of an over-dose gives rise to most distressing and often alarming symptoms, and could conceivably induce death by anaphylactic shock.

24 West Fiftieth Street.

THE DEAF

Their Education—Improvement of Conditions—Responsibilities and Participation of the Profession.

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The aim of this department of THE LARYNGOSCOPE will be to bring to the notice of its readers from month to month, facts that may be helpful to physician and patient in dealing with the life-problems involved in deafness. Suggestions from readers will be gladly received and all questions answered to the best of our ability.

Prophylaxis of Deafness.*

Helping the deaf during and after the school age is pedagogic or social, but previous to the child's entrance in school it is almost exclusively medical.

We shall not deal here with the help that must be rendered to the little deaf children under the same conditions as to other infants, but rather of the prophylaxis of a disease that may, perhaps, be prevented.

Is there a *prophylaxis* of deafness, and of what does it consist?

All specialists, teachers or doctors who deal with deafness classify the deaf as congenital and adventitious. This classification answers to the facts. Still, we believe with Itard, that it is logical to include with the congenitally deaf not only those deaf from birth but also those children who have become deaf in infancy, because it is very difficult to know, in the first few months after birth, whether a child can hear or not.

We call adventitiously deaf those children who, having spoken in an undisputable way, have become deaf as the result of some illness and have consequently lost the use of speech. As this loss of speech does not occur generally except in the case of children less than 8 years of age, this class is normally included in the study which we propose to make.

*From the French of Robert Jouet, Head of the Clinic at the National Institution for the Deaf in Paris. Revue Generale de L'Enseignement des Sourds-Muets, June, 1914.

How shall prophylaxis be exercised in regard to these two classes of the deaf?

Let us begin with congenital deafness. At all times authors have accused consanguinity as one of the causes of deafness, and in America they have even talked of preventing marriages between consanguineous relatives.

The influence of consanguinity is undoubted, still it does not seem to deserve such ostracism, because marriage between first cousins is far from always producing deaf children. Moreover, in the statistics of the deaf, the percentage of deafness from consanguinity seems to decrease as the observations become more exact.

In 1862, Boudin found a proportion of 28.35 per cent. Later, Ladreit de Lacharrière found seventeen children the issue of consanguineous parents out of one hundred and seven deaf children, that is 15.8 per cent. Our teacher, Castex, in his report to the International Congress at Madrid (1903), indicates a proportion of 8.49 per cent.

Statistics which we have personally made, very recently, gives us among four hundred and seventy deaf children, a proportion of 7 per cent as issue of first cousins, and for the children of parents consanguineous in any degree, a proportion of 10 per cent.

So, if a doctor is consulted as we have been in regard to marriage between first cousins, he may discourage it as much as possible, but the statistics that we have just recalled do not authorize him to forbid it.

But the doctor's attitude should be very different if he is consulted on the subject of marriage by a syphilitic. Hereditary syphilis is a frequent cause of congenital deafness, as we found twenty-four out of four hundred and seventy cases, that is a proportion of 5 per cent. If the case of syphilis is recent, the doctor must forbid marriage; if it is an old case and the patient has been treated regularly for four years marriage may be permitted, on condition that the patient will follow a previous intensive treatment for six months.

If the wife is pregnant, she must undergo during her pregnancy a specific treatment, and the child, after its birth, must also follow this treatment under the doctor's instruction.

In the case of some other cause of congenital deafness, one is often limited to hypothesis, and whether it is a case of intra-uterine meningitis, as Castex and Marchand have thought, or of an entirely different etiology, the doctor's part is merely to diagnose deafness and to urge the parents to be patient until the child reaches the age required for admission to a special school.

The part of the physician is much more important when we deal with the prophylaxis of adventitious deafness.

The discharges of the ear have been too long considered as a necessary evil. We shall never know how many unfortunates have become deaf owing to that error, shared by only too many physicians.

Happily, at present, the specialist is consulted much more promptly and the otites are better treated. It is our belief that this is one of the reasons why adventitious deafness, formerly most frequent, has passed to the second place. In fact, Castex, in a total of ninety-five cases finds seventy congenitals; that is a proportion of 73 per cent; and we ourselves, of the four hundred and seventy deaf children we have observed, find three hundred and forty-eight congenitals, that is 74 per cent.

Not only are otites better treated but they are also rarer than before because of the removal of adenoid growths which has become so general in practice.

We frequently hear of a doctor, who, having ascertained the presence of adenoid growths, has advised waiting till the child is 7 years old before operating.

Why this fateful age of 7? We do not know, but that which we do know well is that the child having a source of infection at the entrance of the ear will be exposed to otites and all their complications (mastoiditis, labyrinthitis, deafness, meningitis, etc.).

So it is necessary that the child having adenoid growths should be operated on as soon as possible and that operation must not be a provisional one, as many yet think. One must not be satisfied with just lifting with a pair of tweezers "the biggest" of the growths so as to allow the child to breathe.

The operation must be complete whatever the age of the child, because the growths near the Eustachian tubes are the most dangerous and only the curette can remove them.

We are certain by proceeding thus we shall no longer see those interminable otites which are the despair of doctors and of patients, and a good prophylaxis of deafness will be made.

Many cases of adventitious deafness follow contagious diseases (typhoid, scarlet fever, measles, etc.) There, also, the specialist must intervene at the slightest alarm, and it would always be well, during the course of these diseases, to make a careful disinfection of the nostrils and ears; in this way the possibility of otitic complications would be greatly reduced.

Finally, it would be well if all school children would be examined by a specialist who could thus discover either adenoids or a dis-

charge which has been unperceived by the child or those around him. He might also be able to ascertain in the child the traces of hereditary syphilis and establish a treatment which would often prevent hereditary deafness, all the more terrible because it is incurable and because it appears at an age (generally between fourteen and eighteen years) where the child cannot even be admitted to a special school for the deaf.

We are convinced that these measures of prophylaxy would considerably diminish the number of deaf, both congenital and adventitious.

CONCLUSIONS.

Prophylaxis of deafness: A—Against congenital deafness. 1. Discourage as much as possible consanguineous marriages. 2. Forbid the marriage of a syphilitic who has not received regular treatment. B—Against adventitious deafness. 1. Treatment of otitis. 2. Radical operation for adenoid growths, no matter at what age. 3. Disinfection of the nostrils and ears in all children suffering from infectious diseases. 4. Specific treatment of children presenting symptoms of hereditary syphilis. 5. Monthly visit by an oto-rhinologist to all school children.

Nasal Splint. E. P. HALL. *Jour. A.M.A.*, May 23, 1914, p. 1636.

Hall describes and illustrates a satisfactory nasal splint which holds the flaps in position, in order to prevent hemorrhage, and offers no obstruction to discharge of nasal secretions and permits free nasal respiration. The splint should be left in position for at least forty-eight hours.

Empyema of the Maxillary Sinus Following Tertiary Nasal Syphilis. G. ALAGNA, *Arch. intern. de Laryngol.*, Jan.-Feb. 1914, p. 109.

The canine fossa was trephined but the trepanation was not closed so that the newly forming sequestrum could be removed. A thorough anti-syphilitic treatment supplemented this therapy. ED.

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON LARYNGOLOGY AND RHINOLOGY.

Regular Meeting, November 26, 1914.

DR. J. HENRY GÜNTZER, Chairman.

Retro-esophageal Abscess; Specimen. Presented by DR. W. W. CARTER.

DR. CARTER said that this case, which he had encountered on the previous morning, presented a very interesting and at the same time a very trying experience. The patient was eight months of age, and had been admitted to Gouverneur Hospital two days before, suffering somewhat from dyspnea, and being unable to swallow anything. The dyspnea gradually became worse, and on Tuesday morning the child was referred to Dr. Carter's service. The finger-nails were blue, there was a severe dyspnea, and the child was in a very dangerous condition; so before making the examination he had an intubation-set ready and was also prepared to do a tracheotomy if necessary. Judging from the history of the case, it was a retro-pharyngeal abscess and that was what he expected to find. The examination, however, revealed no bulging at the posterior wall, and no obstruction, as far as could be seen. The examination made the child very much worse, and in a few minutes it stopped breathing. A tracheotomy was performed and artificial respiration was attempted, but without avail. The wound was enlarged toward the sternum, and when an incision was made backward by the side of the trachea and the esophagus just above the sternum, pus spurted out under considerable pressure from an abscess behind the esophagus. Looking into the tracheal wound the interval between the rings was seen pushed forward into the lumen: it was so well demarcated that the house surgeon asked if it was not a false membrane.

Dr. Carter said that so far as he knew there was nothing that could be done for a condition of this kind. In recalling the circumstances of the case he could think of nothing that could have been done to have saved the child's life, for the abscess was below the larynx and it was practically impossible to have reached it through the mouth. The more direct route to the abscess would have been from the outside, but that could not be attempted for the child was *in extremis* at the time.

A Case of Papillomata of the Larynx and Epiglottis Under Radium Treatment. Presented by DR. LEWIS A. COFFIN.

DR. COFFIN said that inasmuch as the treatment of papillomatous growth of the larynx by radium had been discussed at the last meeting of the section, he had asked this patient on whom he had used radium the previous day—by applying it to the large papillomatous masses existing in the larynx and on the laryngeal surface of the epiglottis—to come before

the section now, that the members might see the condition at practically the time of the application of the radium; and he promised to present the case at each subsequent meeting until such time as the growths shall have disappeared, which he expected would be in about two months. Dr. Coffin said he had used 100 mg. of the bromide of radium, applying it for thirty-one minutes to the lower and larger growths, and for twenty minutes to the growth on the epiglottis. Dr. Coffin said no further application would be made, and that he would make a detailed and formal report of the case when he should present the patient for the last time.

DISCUSSION.

DR. EMIL MAYER said that he had been very much interested in the case of scleroma of the larynx, as it was a further illustration of the usual history of these cases. Most of them come from Russia, from a territory about forty miles around Minsk, where the disease is endemic. There is no case on record of scleroma appearing in any one born in the United States. Dr. Mayer said the statement had been made that there was nothing in the nose of this patient, but that he had found a dry secretion on the middle turbinate, and if that were removed some scleroma might be found underneath.

The question of what can be done for these patients is very important, and now that we have the aid of suspension laryngoscopy, something may be found that was not known in former years. Most of the members could probably recall seeing patients with this condition in Vienna going around wearing tracheotomy tubes for an indefinite period. Dr. Mayer said that he considers tracheotomy one of the very last things to be done for these patients. They will stand a great deal of manipulation. One patient had been sent to Mount Sinai Hospital to have a tracheotomy done some five or six years ago, but it was not done at the speaker's recommendation. She rather enjoys the introduction of the bronchoscope tube, and she is getting along very well.

DR. GUTTMANN asked whether the pathological specimen in the rhinoscleroma case showed any Mikulicz cells. It was rather strange that the disease should appear in the larynx and show no signs in the nose, whereas the name would point to a primary affection of the nose. He said that he did not doubt the diagnosis, but the pathological findings would be of interest. He would also like to know why Dr. Freudenthal had not applied radium treatment. Several cures had been reported with the treatment by radium.

DR. HARMON SMITH said that he would like to hear some remarks on the subject of scleroma from the chairman, Dr. Güntzer, who had made more extensive investigations along this line than any one of his acquaintances, especially with the vaccine injections. It would be very interesting to hear his report on cases that had been submitted to him for experimental purposes.

DR. GÜNTZER said that within the past three or four years he had treated three or four of these cases with injections of a vaccine of the bacillus of Frisch, named after one of the leaders in the investigation of this disease, but that having had these cases under observation for only three or four years he hardly felt that it was long enough to estab-

lish definite conclusions, in view of the fact that it is a very slow-growing disease. While these cases had been under his observation, however, he could not see that the growth had increased in any way. The x-ray had been tried, but it did not give the good results they claim to get in Europe. Dr. Emil Mayer had had a case where the larynx was opened and the x-ray was applied directly for a certain period of time, with very satisfactory result. Dr. Güntzer then told of one of the cases which he treated with an autogenous vaccine for the past three years and which is getting along very well. The vaccine injection treatment seems to hold the disease in check better than anything that he has tried, but it is hardly fair to judge its efficacy in so short a time.

Replying to Dr. Guttmann's question about Dr. Freudenthal's case, Dr. Güntzer said that he was quite sure the case had been submitted to pathological and histological examinations. The elements mentioned—Mikulicz cells and hyaline bodies—were always found in rhinoscleroma tissue.

Dr. Heller said that Dr. Carter's account of the case of the child who died because nothing more could be done for it coincided with an experience of his own. The patient was seen in Königsberg, and the condition was as much like this one as two cases can be—a collection of pus surrounding the larynx a little below the thyroid cartilage, it burrowed down between the esophagus and the trachea. The pus was evacuated and the dyspnea markedly relieved, but the next day while making some movement in bed the patient died suddenly. The case was especially impressive as the patient was not suffering so much from pressure or dyspnea as from the general symptoms of toxemia, and the explanation given was that he died from systemic toxemia, which seemed very likely.

Dr. Chambers thought that it was evidently an abscess of the thyroid gland.

Dr. Carter replied that the abscess was behind the esophagus in the posterior mediastinum, not between it and the trachea wall.

Dr. Güntzer asked whether any examination had been made of the spinal column.

Dr. Carter replied that that question had been asked of Dr. Francis Huber, the physician who had charge of the case in the medical ward of Gouverneur Hospital and who had made a thorough examination of the child, and he stated that there was no evidence of tubercular caries or any other condition that might have caused the abscess. The appearance of the inside of the abscess cavity was that of a lot of broken-down glandular tissue; it looked as though several glands had been involved in the process. The abscess was quite a large one. The case had especially interested him; he felt that the great majority of cases so affected would necessarily end fatally, for he could see no way of relieving them quickly and without adding greatly to the shock in an already exhausted patient.

The Treatment of Hay-fever by Active Immunization. Dr. Robert A. Cooke.

Published in full in this issue of The Laryngoscope, *page 108.*

DISCUSSION.

Dr. Hays said the only reason he was sorry to hear Dr. Cooke read this paper was that he himself had for the past two years been investigat-

ing in the same direction, and had just published an article on the subject, but had not been able to reach so many valuable conclusions as had Dr. Cooke. Of course, one who works at the subject from the literary or medical point of view regards it differently from the nose and throat specialist. The point that had particularly interested him was that the specialist is liable to consider that hay-fever, and perhaps asthma also, is due to localized condition and can be cured by various operations or by relieving the congestion. Ballenger says that many cases of hay-fever and asthma are due to sinus disease.

Dr. Hays said that he knew that pollen had a great deal to do with the causation of hay-fever and asthma and it seemed to him from what he knew of the subject at present that cures or relief could be obtained in many of the cases by the proper use of so-called vaccines. This summer, realizing that there was a certain biological analogy between hay-fever and certain skin diseases, he thought he would be able to cure the former by the use of auto-serum. At the City Hospital the dermatologist had obtained excellent results in treating psoriasis and other skin lesions in this way. He was able to try the experiment of injections of auto-serum, but all the cases so treated were absolute failures. He had read numerous reprints of the treatment of hay-fever by autogenous vaccines but most of the reprints were very unscientific, and the idea did not appeal to him that the trouble was caused by a local condition.

Dr. Hays said he believed that there was little question that certain conditions in the nose and throat aggravated the hay-fever condition and made the patient more susceptible to the influence of pollen—for instance a deviated septum or hypertrophied turbinates, and therefore in many instances patients have been relieved, but not cured, by certain local operations. The relief is due merely to the lessened amount of pollen which gets into the system after the engorgemnt of the mucous membranes is relieved.

It is very likely that there are specific pollen which cause hay-fever in susceptible individuals. In some instances the hay-fever is caused by ragweed, in others by golden-rod, and in others by timothy grass.

One must sound a warning. It has been fairly well proved that certain proteolytic changes take place when the pollen is highly diluted. It is also well known that large doses of pollen extract may give severe anaphylactic reactions. It is, therefore, necessary that one have a sound knowledge of the basic biological conditions before he treats patients in this way. He said that he thought Dr. Cooke would agree with him that only men with experience in the treatment of cases along this line should attempt this work. The average nose and throat specialist has not the proper training to undertake injections of vaccines of this character. Although successful results might be attained in many cases, in a number of instances one is likely to meet with disaster. One more point must be emphasized and that is that the injection of these vaccines results in cures in very few instances, but that their injection does result in an immense amount of relief which is more than worth while. One must not promise too much in the treatment of these cases.

Dr. Seymour Oppenheimer said: I have been more than keenly interested in the problem of active hay-fever immunization for some time past.

The work of the past two years demonstrates that at last we are on the right track, and that we are beginning to reach a point where the future seems to be full of hope in accomplishing something for these miserable sufferers who consult us. The underlying basis of all our work rests on the problem of immunity, pathogenicity, and individual susceptibility. Dunbar's application of modern methods of immunology to the problem of pollen disease gave it the first real scientific foundation. Dunbar's endeavors were to produce a passive immunization by means of specific anti-toxins against a supposed pollen toxin. This work has not been as successful in any other hands. It is true that the hay-fever of Europe is not the hay-fever of America. The early work which Dunbar did in active immunization work he gave up owing to the severe reactions which he encountered. This, we believe, to be due to excessive dosage; this having been about 100,000 times as great as our initial dosage. The pollen cell differs from many other unicellular micro-organisms, which cause infectious diseases, as it lacks the faculty of increasing within the host. It is a formed poison indifferent to some and intense to others. Under certain conditions which interfere with the normal digestive function of the nasal mucosa, foreign proteid is resorbed in sufficient amount to lead to sensitization. The rationale of our present method of treatment, namely, active immunization has for its object the establishing of higher tolerance of the mucosa of the upper air passages for pollen proteid. Whether this immunization can be permanently established or whether at each periodic exposure re-immunization must be employed, is the work of the future to decide. The knowledge of the problems of the collection of pollen, the animal experimentation work, the antigen preparation, the compliment reactions, the skin anaphylactoxicoses and the correct dosage are necessary for this method of treatment to be carried on to a successful issue. Nor is it a treatment to be conducted by the many, but by the few. It demands the closest relation of the clinician to the trained laboratory worker and physiological chemist. I fear there will soon be on the market a vaccine which probably will be heralded as a cure-all for hay-fever. This will be most unfortunate, as our solutions for injection are not stable and have to be freshly prepared within a given time. I hope that this commercial introduction and the ill-results which must follow its use will not throw discredit on a valuable proposition. Our own experience is limited to the treatment of eleven cases, of which there were five seasonal cures, two failures and four definite improvements. These cases were under the observation of my associate, Dr. Mark Gottlieb, who will speak further on the subject.

Dr. Mark Gottlieb (by invitation) said: My experience with the active immunization of hay-fever patients has been limited to eleven cases, five of which were cured for the season, four were markedly improved, and two were not improved. Of the two who were not improved, one patient had a polypoid degeneration of the left middle turbinate and had attacks of asthma with the hay-fever; the other was a patient who could not, it appears, develop enough immune bodies to cope with the vaccine.

We have given up the intra-cutaneous and ophthalmic methods of diagnosis to determine which pollen is operative in a given case, because the

intra-cutaneous method is a painful one, and the eyes in the ophthalmic method become swollen, which frightens and discourages the patient. We use, instead, a simple skin scarification method and rub a very minute quantity of pure pollen into the scarified area, at the same time using a negative control. The results with this method are just as good without the disagreeable by-effects.

It is very important to know in the course of prophylactic treatment, when enough immunity has been produced and thus when to stop treatment. For this purpose one of two methods may be employed. The complement fixation method, using an extract of that particular pollen, which is injected in the given case, as antigen, making a test before treatment is begun and one after every ten injections. It can also be estimated whether the patient's sensitiveness is waning by the intensity of the skin scarification method. The reaction from this method should grow less and less as the patient's resistance is raised; this is very easy to determine by measuring the initial reaction and then all subsequent reaction for comparison.

Mixing the pollen extracts is a fallacy in my mind, because the patient as a rule is more susceptible to one pollen as compared to another and he may become immune to one very much earlier than to another.

To show that there are great possibilities in this form of treatment and passive immunization, I shall cite a case in point. About two ounces of blood was taken from a vein of a patient, who was immunized against rag-weed. After the proper precaution of making a Wassermann reaction, I injected 8 cc. of this serum subcutaneously into the arm of a boy of 13 years, who was in the middle of a violent attack of hay-fever. Within forty-eight hours this little patient had not a symptom of pollinosis and no signs of the disease reappeared during the remainder of the season.

I thank the section for the courtesy extended me to discuss this subject and Dr. Seymour Oppenheimer for his co-operation in this work.

DR. SMITH said his observation had led him to believe that it was to a certain extent a psychological condition and suggestion played a large part in its recurrence. The flowering of the plants did not always come on with the same exactness with which the attacks occurred, yet the patients always had the recurrence of the "rose cold" at a definite date, with but little variation. Not only that, but in a case reported by Dr. Mackenzie, of Baltimore if the patient would look at an artificial rose she would have symptoms of rose cold; but when it was proved to her that it was an artificial rose her symptoms disappeared. Again, after a prolonged rain, when the pollen was washed from the air, the attacks would be most severe. Other patients would go to the top of Mount Washington—above the range of flower pollen, and yet would have the same symptoms. Consequently, there were some cases which were not provoked by flowers; some of which were caused by some animals, as horses, cats and dogs. So one should not credit entirely the very decided proof that has been submitted of the value of vaccines as a radical cure for hay-fever. There were other elements to be considered in the case of these patients, as drugs, correction of nasal deformities and general neurotic treatment. We are, however, on the right line, and it is up to the laboratory to aid the clinical observers to bring about the desired result.

Regular Meeting, December 23, 1914.

Osteo-sarcoma of Superior Maxilla Four Years After Treatment with Radium. DR. SAMUEL MCCULLAGH.

Dr. Freudenthal treated the patient with radium for Dr. McCullagh. The case has already been reported. She first noticed the growth on the cheek about June, 1908. On March 13, 1909, Dr. McCullagh operated, sectioning the superior maxilla, excepting the hard palate, and Dr. Jonathan Wright made the diagnosis of osteo-sarcoma. Recurrence was noted April 6, 1909, a month afterward. On April 28, the original wound was opened and more of the growth was removed. Until March, 1910, there was no apparent recurrence, but on that date it was again noted, and a specimen which was removed was diagnosed as fibro-sarcoma. At this time it extended very rapidly, and as further operation was impossible the patient was referred to Dr. Freudenthal for treatment with radium. On April 20, radium was applied for fifteen hours, and on June 9, for thirty-six hours. On September 27 of that year there was no trace of the growth, and there has been no recurrence since. She was presented as a case of apparent cure, the last application of radium having been made on June 9, 1910.

DISCUSSION.

DR. FREUDENTHAL said he was sorry he had not arrived in time to hear Dr. McCullagh present his case, which had interested him very much. It was just about four years since the patient had been referred to him for treatment with radium. The aspect of the growth at that time was quite serious, and he feared that it could not be cured, especially as it was one of the first cases which he had seen involving the antrum. The radium was applied the first time for fifteen minutes; the second time, for thirty minutes, and the third time, for one hour, and so on. It had no effect at all until it was put in for thirty-six hours consecutively; then the tissues returned to normal, and when the patient called again a few weeks ago he was surprised to see the change in her whole appearance. About one per cent of these cases can be cured by different methods—injections, sera, etc., but he feels convinced that with the use of radium a much greater percentage can be cured.

DR. HARRIS said that every case like this of Dr. McCullagh's should be reported. It was a very remarkable case, in that it was apparently a positive cure; but the negative results should also go on record, for it was easy for the profession and the public to become inspired by the results obtained by Dr. McCullagh, and to hope for similar results in other cases which might result in disappointment. Dr. Freudenthal and he had tried this treatment on a case of sarcoma of the naso-pharynx, which he had thought promised favorably, but here it failed, the radium having been applied for thirty-six hours. At first it was thought that the condition was checked; it certainly seemed better for a while, but later the growth came back, and though the radium was again applied the patient died. The only conclusion that can be drawn is that in some mysterious way remarkable results are secured in certain cases, but we cannot yet determine what those cases are. We seem, however, to be warranted in proceeding with this treatment in the hope that when we get reports on a sufficient number we may be able to say that in this

group we may hope for a cure, but in that group we must expect a failure.

DR. GÜNTZER asked whether the cases where the bone was involved seemed the more favorable to treatment.

DR. FREUDENTHAL said that he could not state whether or not they were, and told of another case involving the antrum where the bone was not involved. This was a case of Dr. Smith's which was treated about four years before, and was also cured. He thought that was a case of sarcoma also, although he was not positive. There is a very small spot still remaining in the antrum, but the patient is apparently well and in good health, and so far there is no sign of a recurrence.

Syphilitic Stenosis of the Larynx. DR. T. J. HARRIS.

Dr. Harris said that at the last meeting of the Section he had presented a case of syphilitic stenosis of the larynx which had cicatrized and was well fifteen years after operation by Dr. Curtis, in spite of the fact that the Wassermann was positive to-day.

He now wished to report briefly on another case which had been seen by Dr. White and by most of the men at the Manhattan Eye, Ear, and Throat Hospital, which was of unusual interest and worthy of a more careful report. The patient was an Italian who had first presented himself at the Manhattan Eye, Ear, and Throat Hospital over a year ago, suffering with difficulty in breathing. It was very hard to get a view of the larynx on account of the man's thick, short neck and overhanging epiglottis, but with the aid of a spatula a mass was found on the left cord, the movement of the right being more or less limited. The Wassermann test was positive, and the patient was put upon salvarsan without any result so far as changing the Wassermann from positive to negative. The man also received mercury and iodid of potash in indifferent doses. His condition did not change after using salvarsan nor iodids. At no time was he in a very serious condition, but he was taken to the hospital for treatment. About six months ago Dr. White had seen the case in consultation, with the view of giving salvarsan treatment according to his method of frequently repeated doses. It was decided to try this, and accordingly he was given three doses smaller than those usually administered. As a result, the Wassermann reaction was changed from positive to negative, the breathing was cleared up, and the patient was discharged from treatment and was seen at only very infrequent intervals. In all, the man had had fifteen injections of mercury and four injections of salvarsan, one of these being with neo-salvarsan. This fall the man had presented himself at the hospital, apparently as well as ever, and there was no change in his condition until a week ago last Friday, when he re-appeared, suffering with much difficulty in breathing. Examination revealed that the growth on the left cord had become larger, and it was thought well to increase the mercury. The iodid had never been given in large doses for fear that it might cause edema of the larynx. On Monday, the patient was carefully examined by several men, who all agreed that there was limited motion of the right cord—a virtual paralysis of the abductors. On Wednesday, he received a grain of mercury, and on that day his dyspnea had somewhat increased. On Friday, there was still more difficulty in breathing, and the examination showed the growth to

be much enlarged and the immobility of the right cord was almost complete. His condition was not even then grave, although it was thought best that he should enter the hospital, and instructions were given to have a tracheotomy set ready for use if necessary. Dr. Harris saw him that afternoon and attempted to take out a bit of the growth. He entered the hospital at eight and was put to bed. The nurse noticed an increased difficulty in breathing about nine o'clock and went for assistance to the operating room, where Dr. Harris happened to be at the time. The interne immediately went to the patient and found him lying on the bath room floor, but it was impossible to do anything for him on account of his position and thick neck, and he died.

Dr. Harris said that this was the first case of the kind that he had seen. The man died, in spite of the negative Wasserman; and in spite of the four salvarsan treatments and a certain amount of mercury and iodids—not pushed—there was no change in the condition, until he started up the fatal outbreak. Dr. White had not seen the patient during the last week, but before that he had followed the case with great interest.

Dr. White said that he could not add much to what Dr. Harris had said, excepting to refer to a similar case in his own experience. Salvarsan had been administered, also iodid of potassium. Marked improvement followed, so much so that the patient, assuming that he was cured, ceased coming to the clinic for a time, although warned of possible complications. After a considerable absence, he returned, but in worse condition than when first seen. He stated that owing to a recurrence of his throat trouble, he had again taken the "drops," commencing with his maximum dose. Although suffering from a marked edema in and about his larynx, he still refused to enter the hospital, and died at his home two days later. This case and several others treated with salvarsan were reported in a paper read before the Section two years ago.

Dr. Harris had reported his case as one of abductor paralysis; his (Dr. White's) case had been reported as an acute edema, but it was his belief that the same condition pertained in both instances, namely, an edema which, acting mechanically, not only narrowed the glottis, but also hindered the movements outward of the cords. Such cases as these should be treated not only in the hospital, but also by means of the tracheotomy tube.

Dr. Harris said that it had been demonstrated that the proper way to manage these cases was not by expectant treatment, but by tracheotomy. The next problem to be solved is whether edema of the glottis in such cases can be prevented by the use of iodid of potash. This he was not prepared to answer. Dr. White had warned him of the possibility of edema, and he could not say whether if he had pushed the potash it would have cleared up the edematous condition or would have brought it on more promptly. Dr. White thought that his patient was made worse by the iodid. Dr. Harris said that his patient took the iodid at very irregular intervals, and thought he was made worse by the drops. If iodid of potash is used in such cases, the patient should be kept in the hospital.

Dr. Freudenthal said that he felt able to differentiate between two classes; if it is an outspoken bilateral paralysis of the abductors due to tabes, the condition can go on for years if the patients are in an institution. There they have good attention, roll around in their chairs, and

have little exercise. Dyspnea seldom occurs with them. But in the other class, especially where there is alcoholism and the patient is liable to develop edema of the vocal cords at any time, tracheotomy should be performed as early as possible. In former years he had lost three patients with this condition, all of whom died in the streets or cars from sudden edema.

Ludwig's Angina, with Mediastinal Abscess. DR. JOHN E. MACKENTY.

Dr. MacKenty said that he brought this case before the Section, not that he had very much to say about it or expected much discussion, but simply to present a very unusual condition which by great good luck had got well. On November 14, the patient, male, aged 38 years, complained of pain and swelling in left tonsillar region, which grew rapidly worse. On November 17, Dr. Pisani called him in consultation. A typical Ludwig's Angina was present involving the neck and extending down over the sternum. The tongue was pushed up against the roof of the mouth, and he could neither swallow nor speak.

He was admitted to the Manhattan Eye, Ear, and Throat Hospital, and was operated upon the next morning. The throat was incised around under the chin, from ear to ear, and along the clavicles. Under the tongue as far back as the finger could reach was found a small abscess; there was another one under the chin, and a third one at the top of the sternum. Through and through drainage was used in all directions. The patient improved, and was able to swallow liquid food, which he took in large quantities, ingesting as many as ten eggs a day. Two or three days after the original operation, however, the deep fascia of the neck became gangrenous and sloughed rapidly, coming out in great masses, the sloughing extending down along the trachea. Two days later, the patient had a temperature of 105°, and examination revealed a dull area over the chest. There was dyspnea, and the man seemed in an extreme condition; so taking a desperate chance Dr. MacKenty pushed his finger as far down the trachea as it would reach, and there tapped an abscess in the mediastinum, evacuating six ounces of fetid pus. Two tubes were then inserted and the patient was kept in a semi-Trendelenburg position, and with the aid of frequent washings through these, drainage was maintained. It had been feared that the process would extend to the pericardium, but it did not, and now, about six weeks after the onset of the trouble, he was able to present himself and was going on to complete recovery.

The germs found were the staphylococcus and the colon bacillus, and a peculiar spirillum, the nature of which was not determined. The patient suffers from Rigg's disease, and the question which arises is whether the condition began from the bad teeth or from the condition of the tonsil.

Dr. MacKenty said that this was the fourth case of Ludwig's angina which he had treated and operated upon. Of the other three, two had died, one on the table, and the other two or three days later of a mediastinal abscess; the third one, which was not a severe case, got well. Therefore, when he attacked this case it was with considerable fear of the result; but, fortunately, largely due to the patient's excellent health, and the fact that he could digest eggs by the dozen, and the fortunate finding of a way to the mediastinal infection, he also had got well. He

was able to enter the hospital as a private case, and two nurses watched him very closely. It was a very trying case on account of the frightful odor, and one of the nurses suffered so with nausea that she vomited nearly everything she ate, but, sticking to the case, she was largely instrumental in bringing the patient through.

Hemi-laryngectomy for Carcinoma of the Larynx. DR. JOHN MACKENTY.

Dr. MacKenty said that the operation was performed last May and that the patient now had a very good voice, although he was just recovering from an acute cold. The patient has to use his voice a great deal in his work and there is a great strain upon it.

In August, 1913, he began to suffer from hoarseness, and applied to the clinic for relief in March, 1914. Examination at that time showed a small circumscribed growth on the right cord near the anterior commissure. A small piece of this was removed for examination by one of the clinical assistants, and was reported as negative. Dr. MacKenty suspected, however, that the growth had not been included in the specimen, and on May 1, under suspension laryngoscopy, another piece was removed which proved to be carcinomatous, and the case was operated upon on May 7. Dr. MacKenty said that this was the sixth case of hemi-laryngectomy which he had done within the last two years by a method originated by himself. The method aims to obviate pneumonia, and all had made good post-operative recovery. Four of the patients are still living and well, one of them operated upon two years ago. The others could not be located. This last case was attacked early, the growth being located well anterior to the posterior commissure. In one of the cases, the growth extended across the anterior commissure, necessitating the removal of a V-shaped piece from the remaining half of the thyroid cartilage. All the operations were done under general anesthesia.

Operative procedure: A tracheotomy was done as low as possible through a small incision. Then another incision was made through the thyroid and cricoid cartilages, not connecting with the tracheotomy incision. One half of the larynx was then removed, care being taken not to injure, any more than was possible, the pre-tracheal muscles. The mucous membrane of the upper part of the removed portion of the larynx was saved as far as seemed consistent with the extent of the growth. This flap of mucous membrane was dissected free from the upper part of the incision, where it turns over the hypo-pharynx, and brought down and sutured to the pre-tracheal muscles, the object being to line the newly-formed laryngeal wall with a normal mucous membrane. About half of the surface was thus covered.

Vaseline gauze saturated with bismuth was packed firmly into the trachea between the lower end of the incision and the treacheotomy tube. The end of the gauze was brought out at the lower angle of the incision. Plain gauze was loosely packed into the space above—i. e., in the larynx —the end being brought out at the same point as above. The pre-tracheal muscles were brought together with iodized catgut and the skin with silk-worm gut, leaving a small opening at the point of emergence of the two pieces of gauze. Provisional stitches were placed in this opening.

Between the tracheotomy incision and the laryngeal incision a curtain of rubber tissue was secured to the neck with collodion; thus separating

the two incisions. A dressing was placed above this curtain, over the exit of gauze-plug and gauze-drain. In this way no contamination could occur from the tracheotomy wound. The drain in the larynx and the plug in the trachea were removed in forty-eight hours, and the provisional stitches tied. The tracheotomy tube was removed on the fourth day. Before closing the laryngeal wound, a small feeding tube was passed through the nose and directed into the esophagus. Through this the patient was fed for a week.

Primary union occurred in all six cases, and all made good post-operative recoveries. The tracheal plug with the tracheal drain minimize the danger from inhalation pneumonia.

DR GÜNTZER said that Dr. MacKenty was certainly to be congratulated upon the results of the hemi-laryngectomy, as he had worked out something new in the treatment of these cases. Any initiative in our work is worthy of comment and should be noticed.

DR. CARTER, referring to Dr. MacKenty's statement that he had removed the packing from a portion of the tracheotomy wound on the second day, asked how he controls the secretion from the wound so that it does not contaminate the lower wound through the trachea itself. He had not heard just what had been done.

DR. MACKENTY replied that by the second or third day after operation the amount of drainage was very much lessened. In the neck, this drainage is greatly in excess of that in other parts of the body, but on the second or third day it has become so diminished that the packing could be removed. So far this work was purely experimental, as only six cases had been operated in this way in two years, and it has yet to be demonstrated that the procedure is reliable. If the packing is left in the wound too long, it becomes a source of irritation, but before that is reached the packing is removed and the wound closed. Of course, if there is a great deal of irritation, infection may take place afterward; but after two days Nature has begun to take care of the condition to a certain extent, and there is less danger than when the wound is fresh.

Relation Between Acute and Chronic Tonsillitis. BRAUER. *Prag. med. Wchnschr.* Nov. 7, 1914.

Most of the anginas in adults are exacerbations of former acute tonsillites, which did not quite heal. Acute anginas frequently develop into chronic tonsillites and it is essential that cases of acute angina be thoroughly healed. The author advocates a sojourn in the country since dust and smoke are essential factors in throat disorders. If there is, nevertheless, a recurrence tonsillectomy should be performed. ED.